

ZEXEL - TEST VALUES  
Injections pumps

BOSCH No.	:	9 400 610 125	1/4
ZEXEL No.	:	101322-0190	
Date	:	31.10.1990	[1]
Company	:	ISUZU	
Engine	:	3AD1 / 515600-6483	

IP-Type number	:	101032-9031 / PES4A
Governor type number	:	105410-3220 / EP/RSV

TEST PREREQUISITES

Test oil	:	ISO-4113
Test oil inlet temperature °C	:	40.00...45.00
Inlet pressure	bar :	1.6
Test nozzle holder combination	:	1 688 901 013
Opening pressure	bar :	175
Test pressure line		
Inner x Outer Dia - Length	mm :	2.00 x 6.00 x 600

PORT CLOSING

Prestroke	mm :	1.75 ± 0.05
Rod position	mm :	-
Port closing mark	Cyl. No. :	-
Cam sequence	:	1 - 3 - 4 - 2

Port closing mark	Cyl. No. :	-
Port closing difference	°NW :	0-90-180-270

Tolerance	+ - °C:	0.50 (0.75)
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Continued (Test values)

**Injection Quantity :**

Adjusting Point	Rod Pos. (mm)	Speed (rpm)	Injection Q'ty (cc/1000 str.)	Difference (%)	Fixed	Remarks
A	11.5	1000	30.9 - 32.9	± 2.5	Lever	Basic
B	approx. 7.2	385	7.0 - 9.0	± 14	Rack	

**Timing Advance Specification :**

Speed (rpm)							
Advance Angle (deg)							

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ZEXEL - Test values

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**A3**

ZEXEL - Test values

Injection pumps



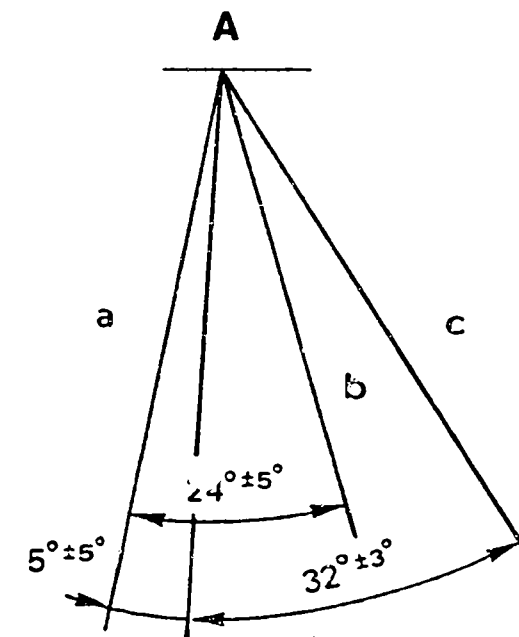
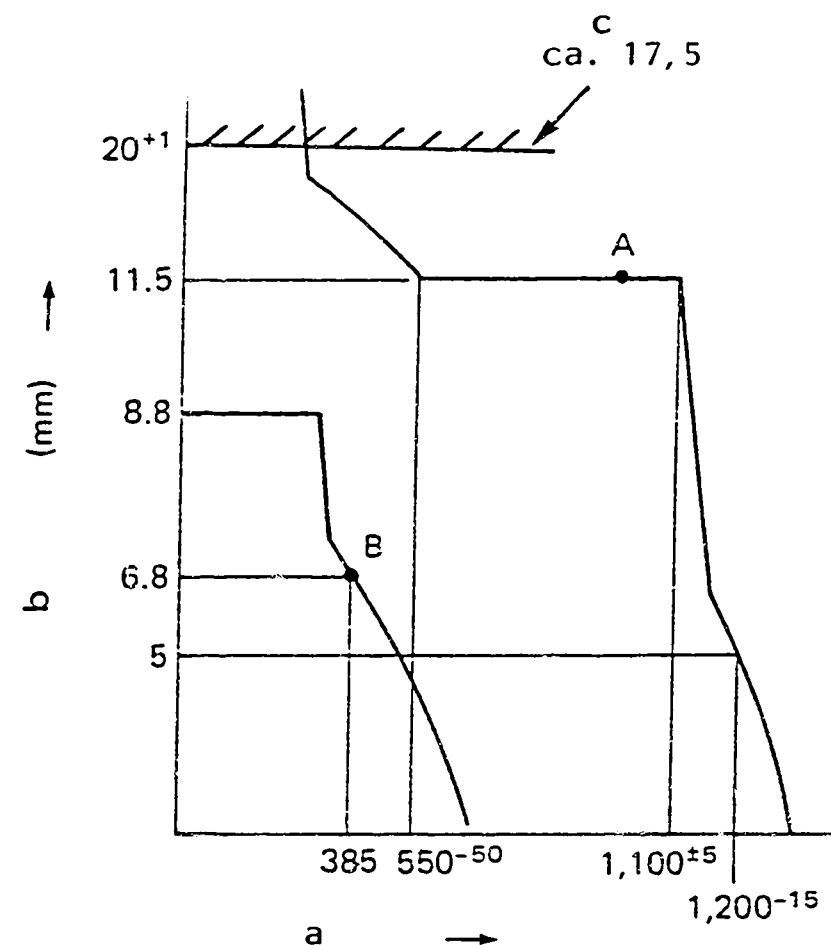


Fig. 1

# GOVERNOR ADJUSTMENT

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a = Pump speed (rpm)  
b = Control rack position  
c = Rack limit

A = Speed control lever angle  
a = Full-speed  
b = Idling  
c = Stop

## Note

- Before adjustment, remove the idling sub spring and the torque control spring.
- Move the control lever fully in the stop direction, and set the minimum-speed stopper bolt so that the control rack position is 0.5 - 1.0 mm.

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A5

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Injections pumps



	Pump speed (rpm)	Rack position (mm)	Remarks
Full-load Adjustment (Temporary)	1095 - 1105	11.5	• Adjust using screw (1)
Torque Control spring Adjustment			<ul style="list-style-type: none"> <li>• Adjust using spring capsule (4)</li> <li>• Confirm</li> <li>• Confirm</li> <li>• Confirm the torque control stroke is mm.</li> </ul>
Idling Adjustment	0 385 -	8.8 6.8 -	<ul style="list-style-type: none"> <li>• Fix the control lever</li> <li>• Adjust using spring capsule (5)</li> <li>• Confirm</li> </ul>
Maximum-speed Adjustment	1095 - 1105 1185 - 1200	11.5 7.2	<ul style="list-style-type: none"> <li>• Adjust using screw (1)</li> <li>• Confirm speed droop</li> <li>• Adjust using screw (3)</li> <li>• Confirm</li> </ul>
Full-load Adjustment (Install the cover on governor cover)	1000	11.5	• Adjust using screw (2)
Control Lever Angle Measurement	<ul style="list-style-type: none"> <li>• Measure the control lever angle at the "idling" and "full" positions.</li> <li>• When the control lever is depressed toward the "full" position, replace the shifter's shim with a thicker one.</li> <li>• When the control lever is depressed toward the "idling" position, replace the shifter's shim with a thinner one.</li> </ul>		
Rack Limiter Adjustment	0	17.5	• Adjust using screw

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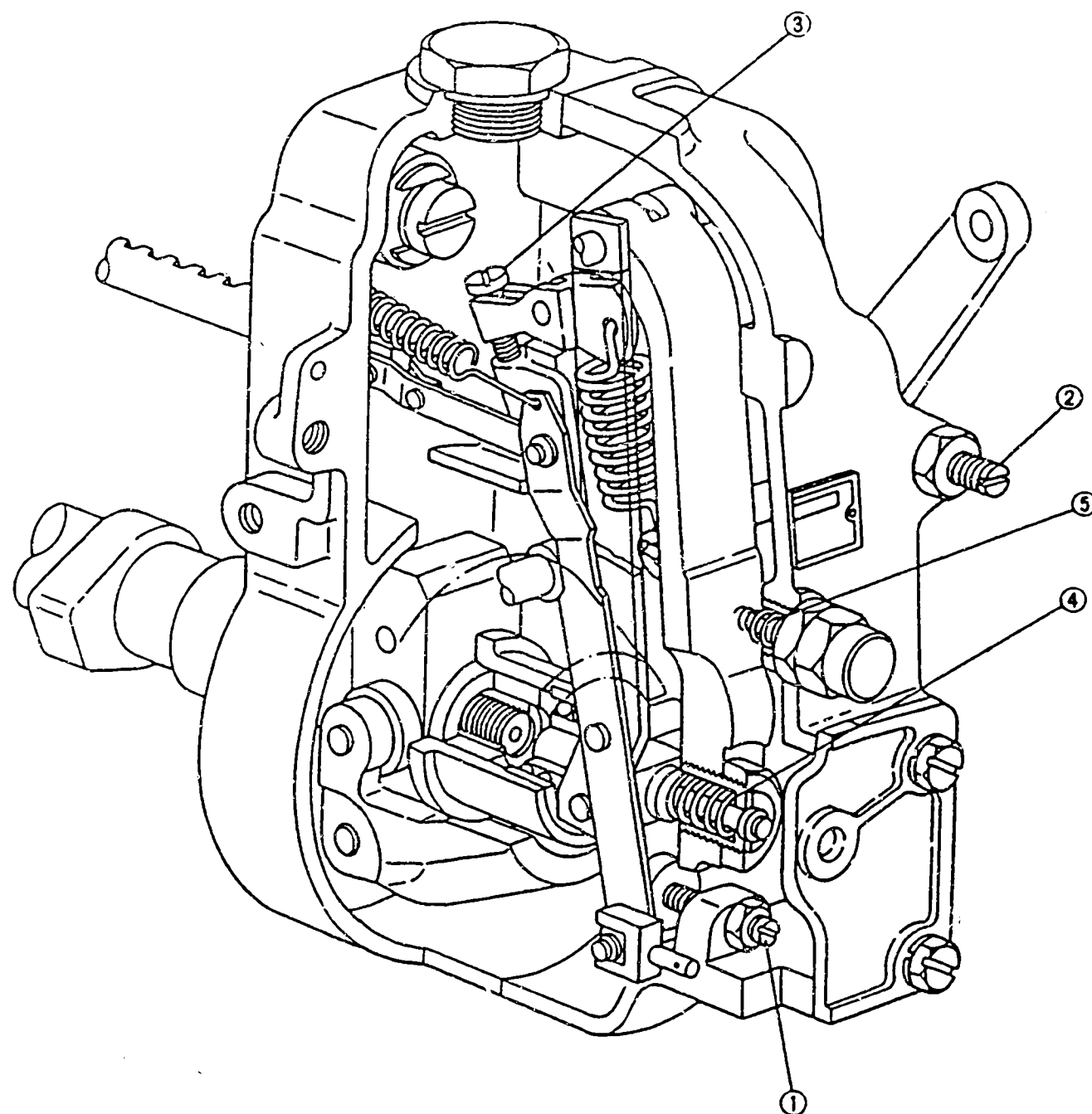


Fig. 2

- 1 = Screw
- 2 = Screw
- 3 = Screw
- 4 = Spring capsule
- 5 = Spring capsule

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ZEXEL - Test values  
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**A9**

ZEXEL - Test values  
Injections pumps



ZEXEL - TEST VALUES  
Injections pumps

BOSCH No.	:	9 400 610 134	1/4
ZEXEL No.	:	101421-4980	
Date	:	31.10.1990	[0]
Company	:	ISUZU	
Engine	:	C190 / 515601-0621	

IP-Type number	:	101042-9760 / PES4A
Governor type number	:	105542-3190 / EP/RBD

TEST PREREQUISITES

Test oil	:	ISO-4113
Test oil inlet temperature °C	:	40.00...45.00
Inlet pressure	bar :	1.6
Test nozzle holder combination	:	1 688 901 013
Opening pressure	bar :	175
Test pressure line		
Inner x Outer Dia - Length	mm :	2.00 x 6.00 x 600

PORT CLOSING

Prestroke	mm :	1.75 ± 0.05
Rod position	mm :	-
Port closing mark	Cyl. No. :	-
Cam sequence	:	1 - 3 - 4 - 2

Port closing mark	Cyl. No. :	-
Port closing difference	°NW :	0-90-180-270

Tolerance	+ - °C:	0.50 (0.75)
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Injection Quantity :

Adjusting Point	Rod Pos. (mm)	Speed (rpm)	Injection Q'ty (cc/1000 str.)	Difference (%)	Fixed	Remarks
	11.7	1800	36.1 - 37.9	± 2.5	Rack	Basic
	approx. 7.2	300	5.9 ~ 8.1	± 14	Rack	
	-	150	above 52	-	Rack	

Timing Advance Specification :

Speed (rpm)							
Advance Angle (deg)							

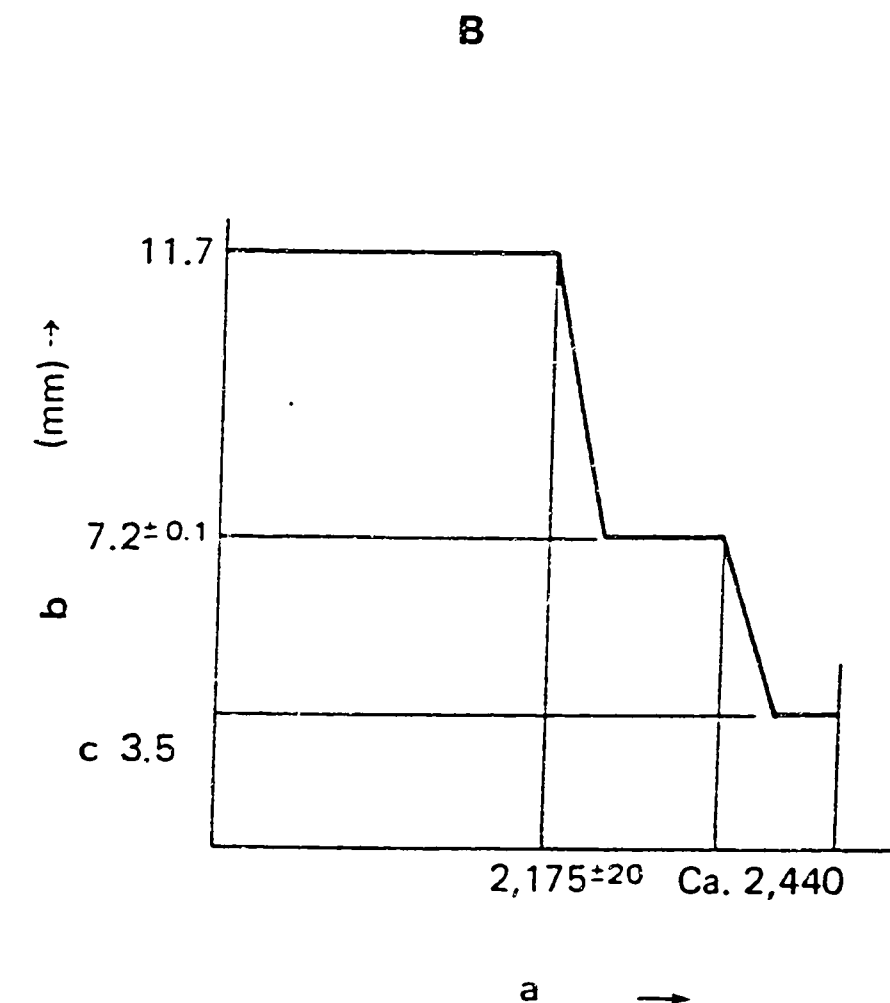
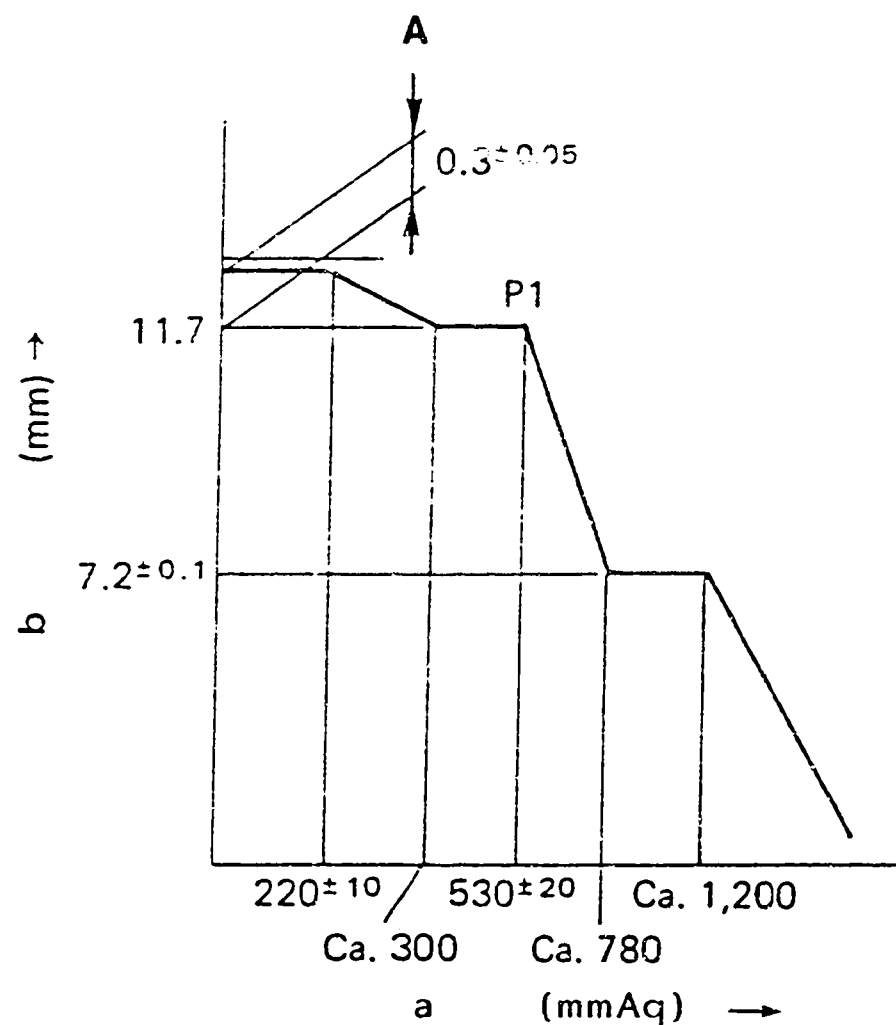


Fig. 3

# GOVERNOR ADJUSTMENT

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A = Pneumatic Governor

a = Negative pressure

b = Control rack position

B = Mechanical Governor

a = Pump speed (rpm)

b = Control rack position

c = Below

## AIR TIGHTNESS TEST

1. Increase the pressure of the pneumatic governor's negative pressure chamber to 500 mmAq at a pump speed of 500 rpm and a control rack position of approx. 12.0 mm.
2. Then, confirm that it takes 10 seconds or more for the negative pressure to fall from 500 mmAq to 480 mmAq.

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Injections pumps

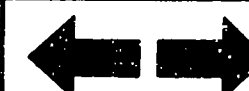


A) Pneumatic Governor (Pump Speed: 500 rpm)

	Negative Pressure (mmAq)	Rack Position (mm)	Remarks
Smoke Set Screw Adjustment	0	12.0	• Adjust using spring caps. (6)
Torque Control Adjustment			
1) Start of torque control spring movement	210 - 230	12.0	• Adjust thickness of shim (1)
2) End of torque control spring movement	approx. 300	11.7	• Adjust thickness of shim (2)
3) Confirm torque control stroke	-	-	• Inspection: 0.2 - 0.4 mm
High-speed Control Adjustment	510 - 550	11.7	• Adjust thickness of shim (3)
Idling Adjustment	approx. 780	7.1 - 7.3	• Adjust using spring capsule (4)
	approx. 1200	7.1 - 7.3	• Confirm

B) Mechanical Governor (Negative pressure: 510 - 550 mmAq)

	Pump speed (rpm)	Rack Position (mm)	Remarks
Maximum Speed Control Adjustment	2155 - 2195 approx. 2440 approx. 2800	11.7 7.1 - 7.3 below 3.5	• Adjust using screw (5) • Confirm • Confirm (Check the fuel injection quantity: below 3 cc/1000st)



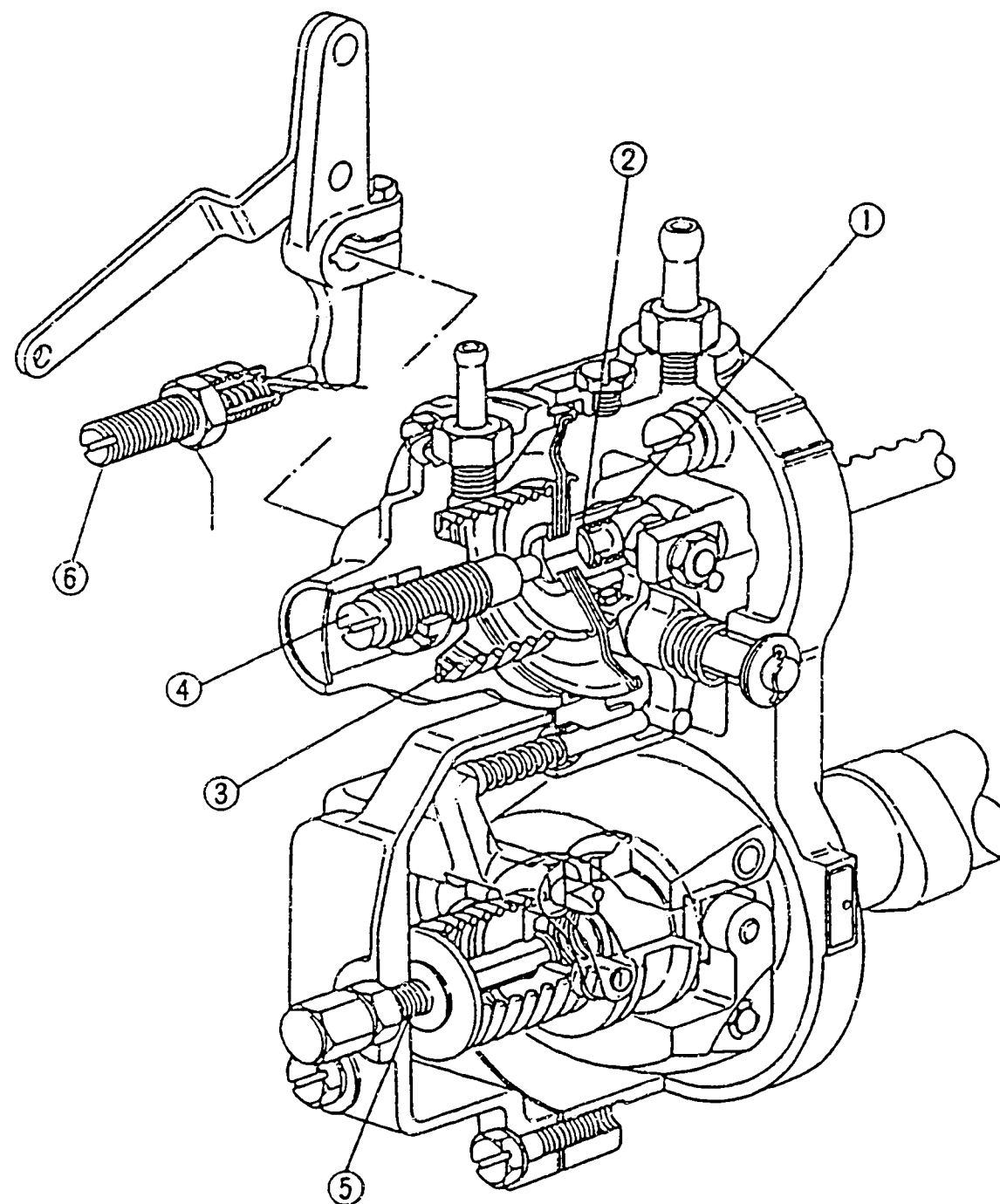


Fig. 4

- 1 = Shim
- 2 = Shim
- 3 = Shim
- 4 = Spring capsule
- 5 = Screw
- 6 = Spring capsule

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ZEXEL - Test values  
Injections pumps



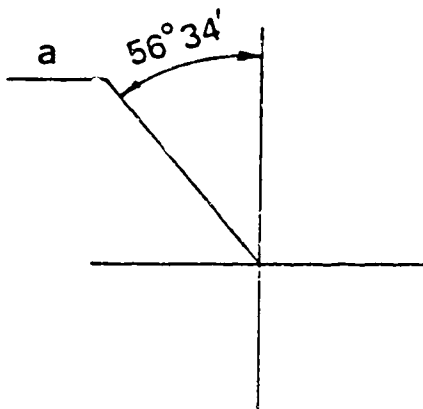
**A18**

ZEXEL - Test values  
Injections pumps



■ FINAL ADJUSTMENT

Smoke Setting			Fuel Injection Quantity Adjustment		
Pump Speed (rpm)	Negative Pressure (mmAq)	Injection Q'ty (cc/1000st)	Pump Speed (rpm)	Negative Pressure (mmAq)	Injection Q'ty (cc/1000st)
1800	11.7	36.1 - 37.9			



■ TIMING SETTING

At No. 4 plunger's beginning of injection position.

B.T.D.C.: 18°

Fig. 5  
Pump center line  
a = Mark "Z"

ZEXEL - TEST VALUES  
Injections pumps

BOSCH No.	:	9 400 610 126	1/4
ZEXEL No.	:	101432-0240	
Date	:	31.10.1990	[0]
Company	:	ISUZU	
Engine	:	C240 / 515601-1682	

IP-Type number	:	101043-9160 / PES4A
Governor type number	:	105542-3430 / EP/RBD

TEST PREREQUISITES

Test oil	:	ISO-4113
Test oil inlet temperature °C	:	40.00...45.00
Inlet pressure	bar :	1.6
Test nozzle holder combination	:	1 688 901 013
Opening pressure	bar :	175
Test pressure line		
Inner x Outer Dia - Length	mm :	2.00 x 6.00 x 600

PORT CLOSING

Prestroke	mm :	2.25 ± 0.05
Rod position	mm :	-
Port closing mark	Cyl. No. :	-
Cam sequence	:	1 - 3 - 4 - 2

Port closing mark	Cyl. No. :	-
Port closing difference	°NW :	0-90-180-270

Tolerance	+ - °C:	0.50 (0.75)
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Injection Quantity :

Adjusting Point	Rod Pos. (mm)	Speed (rpm)	Injection Q'ty (cc/1000 str.)	Difference (%)	Fixe	Remarks
	12.1	750	33.2 - 36.4	± 4	Rack	
	11.5	1100	32.5 - 34.5	± 2.5	Rack	Basic
	approx. 7.9	350	6.1 - 8.3	± 14	Rack	

Timing Advance Specification :

Speed (rpm)							
Advance Angle (deg)							

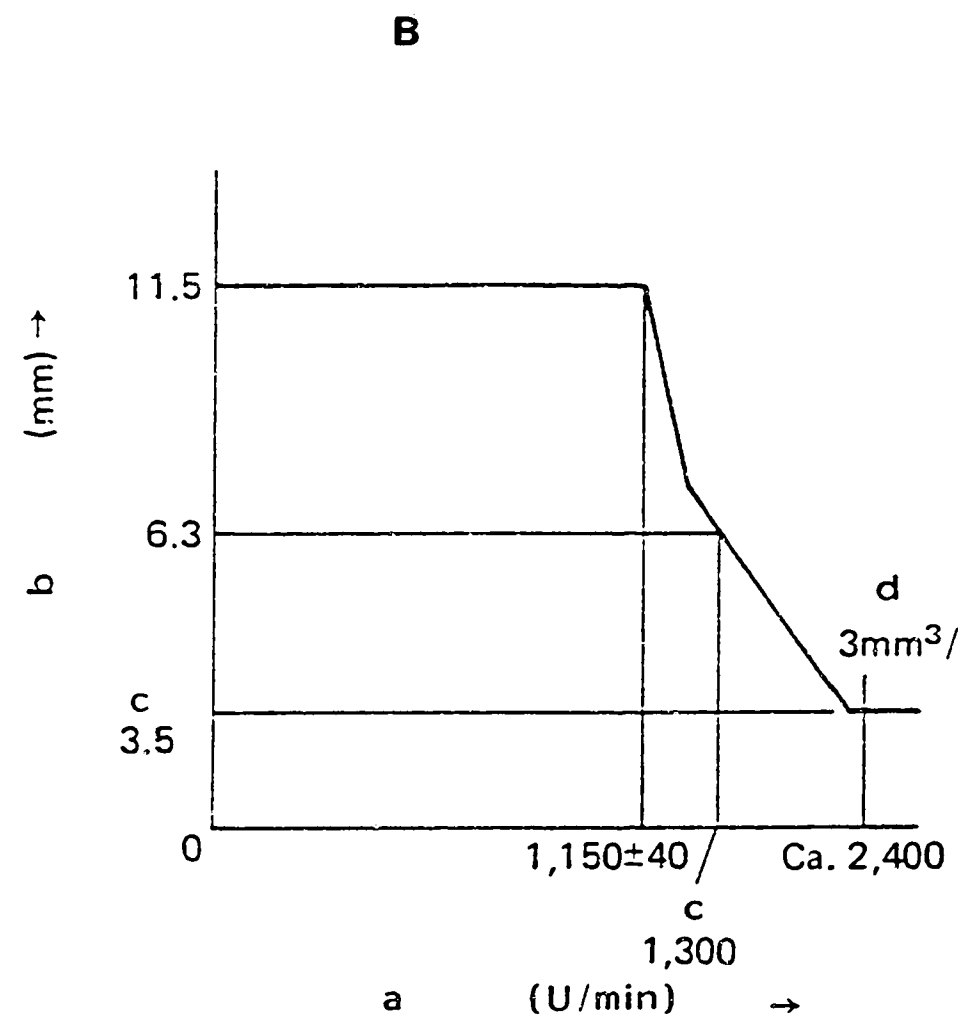
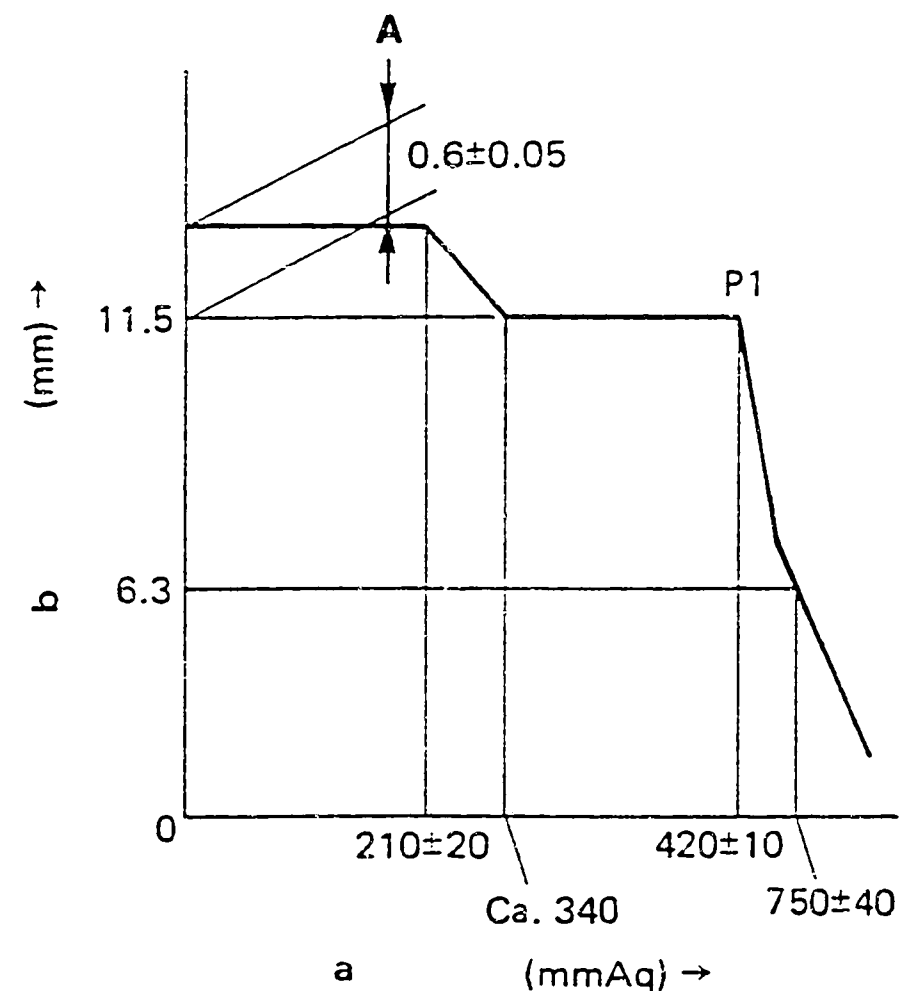


Fig. 6

# GOVERNOR ADJUSTMENT

101432-0240 2/4

A = Pneumatic Governor

B = Mechanical Governor

a = Negative pressure

a = Pump speed (rpm)

b = Control rack position

b = Control rack position

c = Below

d = Below /st

a = Stop

b = Normal

## AIR TIGHTNESS TEST

1. Increase the pressure of the pneumatic governor's negative pressure chamber to 500 mmAq at a pump speed of 500 rpm and a control rack position of approx. 12.1 mm.
2. Then, confirm that it takes 10 seconds or more for the negative pressure to fall from 500 mmAq to 480 mmAq.

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ZEXEL - Test values  
Injections pumps



B5

ZEXEL - Test values  
Injections pumps



**A) Pneumatic Governor (Pump Speed: 500 rpm)**

	Negative Pressure (mmAq)	Rack Position (mm)	Remarks
Smoke Set Screw Adjustment	0	12.1	• Adjust using spring capsule (6)
Torque Control Adjustment 1) Start of torque control spring movement 2) End of torque control spring movement 3) Confirm 4) Confirm torque control stroke	190 - 230  approx. 340  - -	12.1  11.5  - -	• Adjust thickness of shim (1) • Adjust thickness of shim (2)  • Inspection: 0.55 - 0.65 mm
High-speed Control Adjustment	410 - 430	11.5	• Adjust thickness of shim (3)
Idling Adjustment	710 - 790	6.3	• Adjust using spring capsule (4) • Confirm

**B) Mechanical Governor (Negative pressure: 410 - 430 mmAq)**

	Pump speed (rpm)	Rack Position (mm)	Remarks
Maximum Speed Control Adjustment	1110 - 1190  below 1300 approx. 2400	11.5  6.3 below 3	• Adjust using screw (5)  • Confirm • Confirm (Check the fuel injection quantity: below 3 cc/1000st)



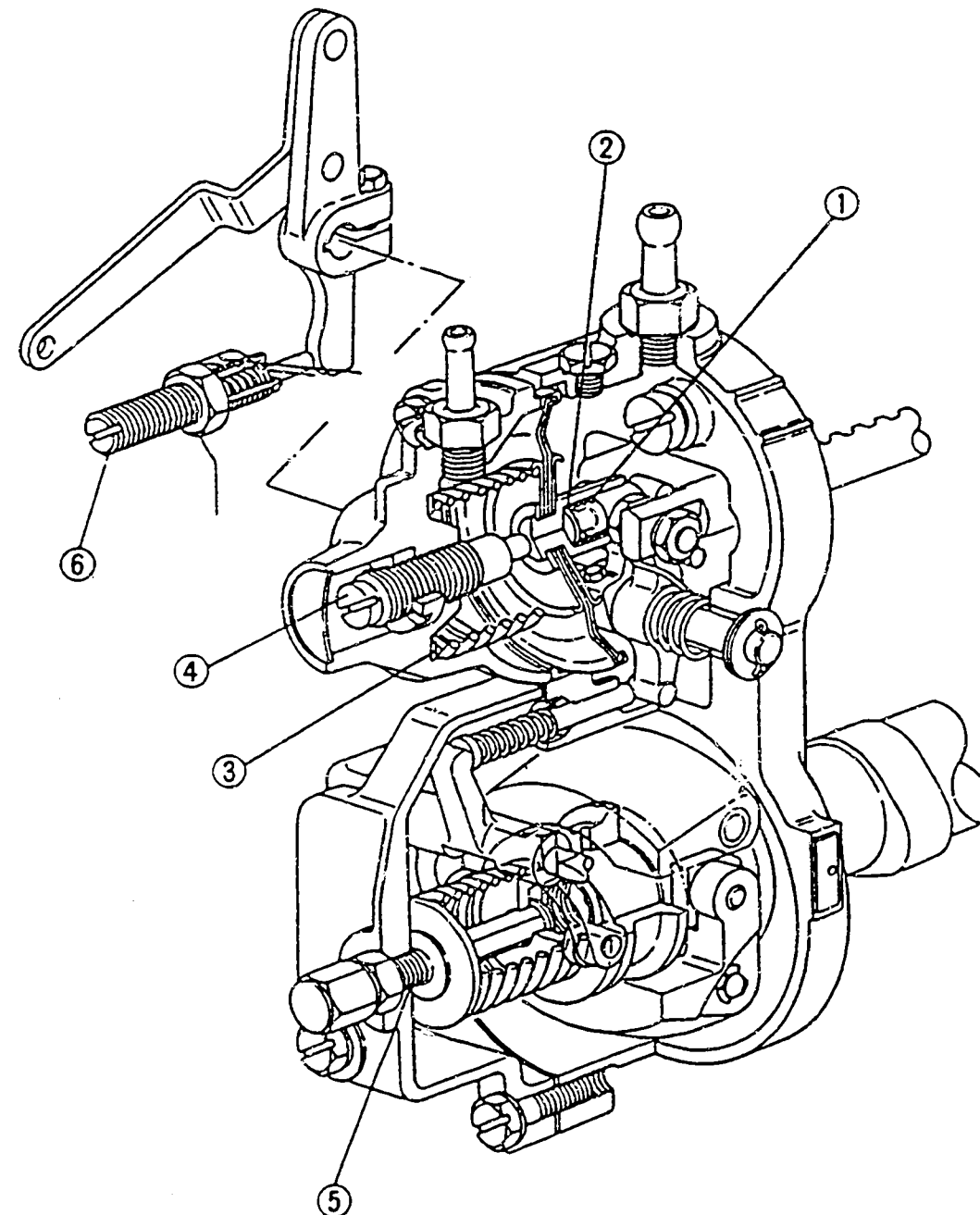


Fig. 7

- 1 = Shim
- 2 = Shim
- 3 = Shim
- 4 = Spring capsule
- 5 = Screw
- 6 = Spring capsule

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ZEXEL - Test values  
Injections pumps



**B9**

ZEXEL - Test values  
Injections pumps



Smoke Setting			Fuel Injection Quantity Adjustment		
Pump Speed (rpm)	Negative Pressure (mmHg)	Injection Q'ty (cc/1000st)	Pump Speed (rpm)	Negative Pressure (mmHg)	Injection Q'ty (cc/1000st)
1100	11.5	32.5 - 34.5			

■ TIMING SETTING

At No. 1 plunger's beginning of injection position.

B.T.D.C.: 18°

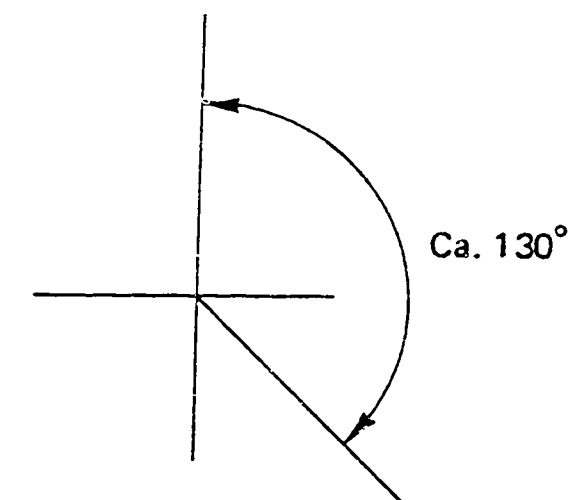


Fig. 8

Pump center line

**B10**

ZEXEL - Test values  
Injections pumps



**B11**

ZEXEL - Test values  
Injections pumps



ZEXEL - TEST VALUES  
Injections pumps

BCSCH No.	:	9 400 610 100	1/4
ZEXEL No.	:	101432-0310	
Date	:	31.10.1990	[1]
Company	:	ISUZU	
Engine	:	C240 / 894139-9530	

IP-Type number	:	101043-9160 / PES4A
Governor type number	:	105542-4030 / EP/RBD

TEST PREREQUISITES

Test oil	:	ISO-4113
Test oil inlet temperature °C	:	40.00...45.00
Inlet pressure	bar :	1.6
Test nozzle holder combination	:	1 688 901 013
Opening pressure	bar :	175
Test pressure line		
Inner x Outer Dia - Length	mm :	2.00 x 6.00 x 600

PORT CLOSING

Prestroke	mm :	2.25 ± 0.05
Rod position	mm :	-
Port closing mark	Cyl. No. :	-
Cam sequence	:	1 - 3 - 4 - 2
Port closing mark	Cyl. No. :	-
Port closing difference	°NW :	0-90-180-270
Tolerance	+ - °C:	0.50 (0.75)



Continued (Test values)

**Injection Quantity :**

Adjusting Point	Rod Pos. (mm)	Speed (rpm)	Injection Q'ty (cc/1000 str.)	Difference (%)	Fixed	Remarks
	10.3	1000	28.8 - 30.8	± 2.5	Rack	
	( 7.3)	300	6.9 - 9.1	± 14	Rack	

**Timing Advance Specification :**

Speed (rpm)							
Advance Angle (deg)							

**B13**

ZEXEL - Test values  
Injections pumps



**B14**

ZEXEL - Test values  
Injections pumps



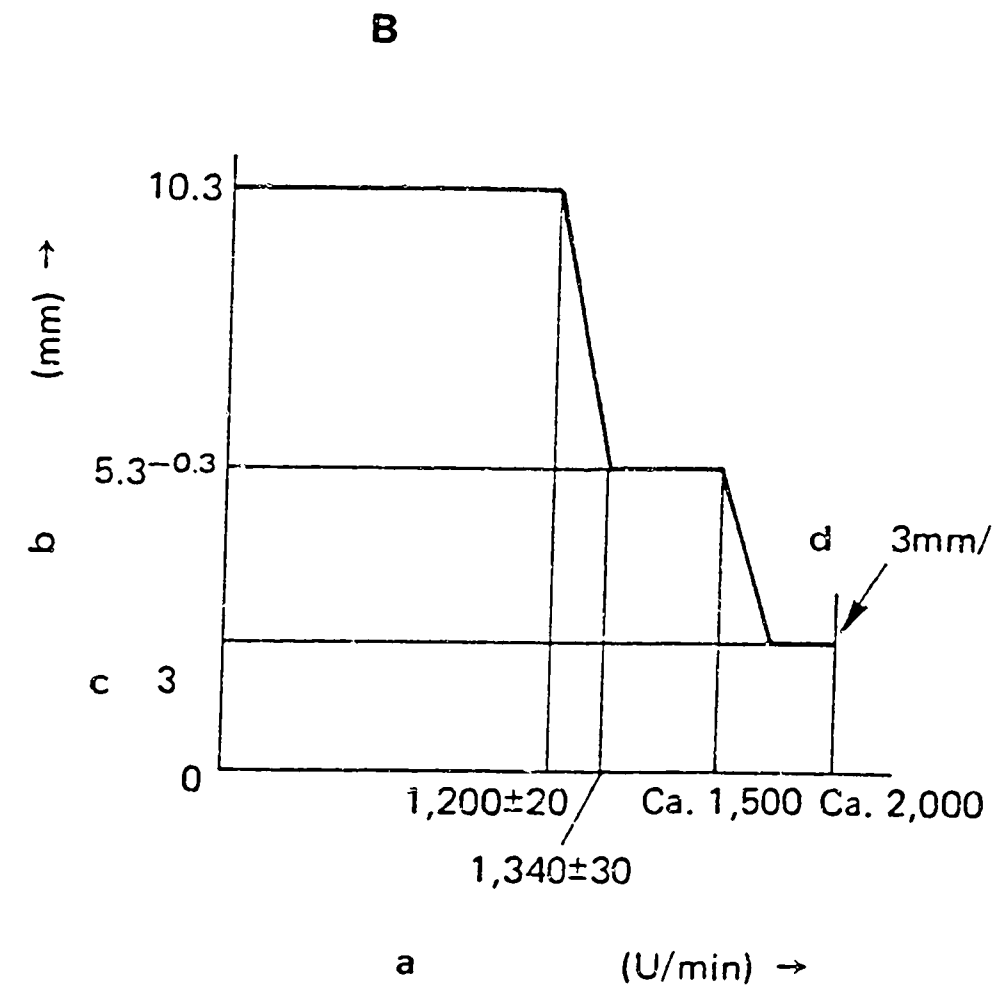
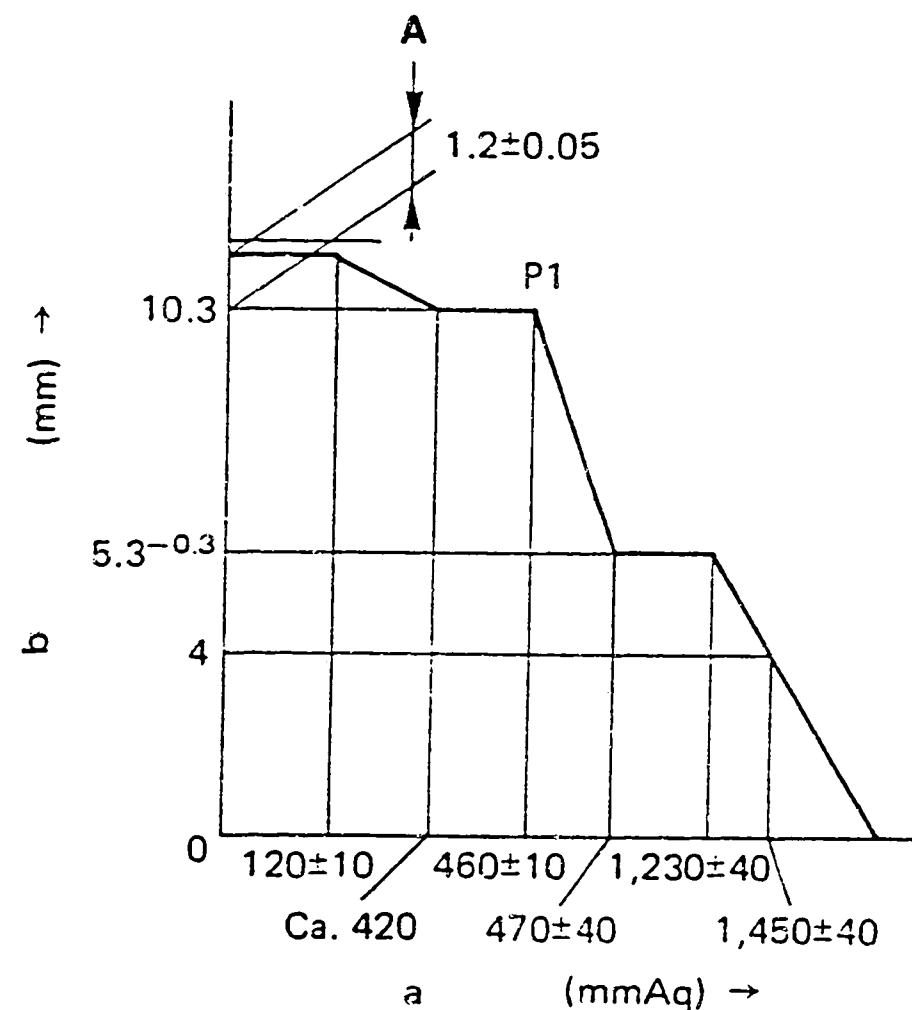


Fig. 9

# GOVERNOR ADJUSTMENT

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A = Pneumatic Governor

B = Mechanical Governor

a = Negative pressure

a = Pump speed (rpm)

b = Control rack position

b = Control rack position

c = Below

d = Below /st

a = Stop

b = Normal

## AIR TIGHTNESS TEST

1. Increase the pressure of the pneumatic governor's negative pressure chamber to 500 mmAq at a pump speed of 500 rpm and a control rack position of approx. 11.5 mm.
2. Then, confirm that it takes 10 seconds or more for the negative pressure to fall from 500 mmAq to 480 mmAq.

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ZEXEL - Test values  
Injections pumps



B16

ZEXEL - Test values  
Injections pumps





## ■ ADJUSTMENT

## A) Pneumatic Governor (Pump Speed: 500 rpm)

	Negative Pressure (mmAq)	Rack Position (mm)	Remarks
Smoke Set Screw Adjustment	0	11.5	• Adjust using spring capsule (6)
Torque Control Adjustment			
1) Start of torque control spring movement	110 - 130	11.5	• Adjust thickness of shim (1)
2) End of torque control spring movement	approx. 420	10.3	• Adjust thickness of shim (2)
3) Confirm	-	-	
4) Confirm torque control stroke	-	-	• Inspection: 1.15 - 1.25 mm
High-speed Control Adjustment	450 - 470	10.3	• Adjust thickness of shim (3)
Idling Adjustment	approx. 720	5.0 - 5.3	• Adjust using spring capsule (4)
	approx. 1320	5.0 - 5.3	• Confirm

## B) Mechanical Governor (Negative pressure: 450 - 470 mmAq)

	Pump speed (rpm)	Rack Position (mm)	Remarks
Maximum Speed Control Adjustment	1180 - 1220	10.3	• Adjust using screw (5)
	approx. 1500	5.0 - 5.3	• Confirm
	approx. 2000	below 3.5	• Confirm (Check the fuel injection quantity: below 3 cc/1000st)

B17

ZEXEL - Test values  
Injections pumps

B18

ZEXEL - Test values  
Injections pumps

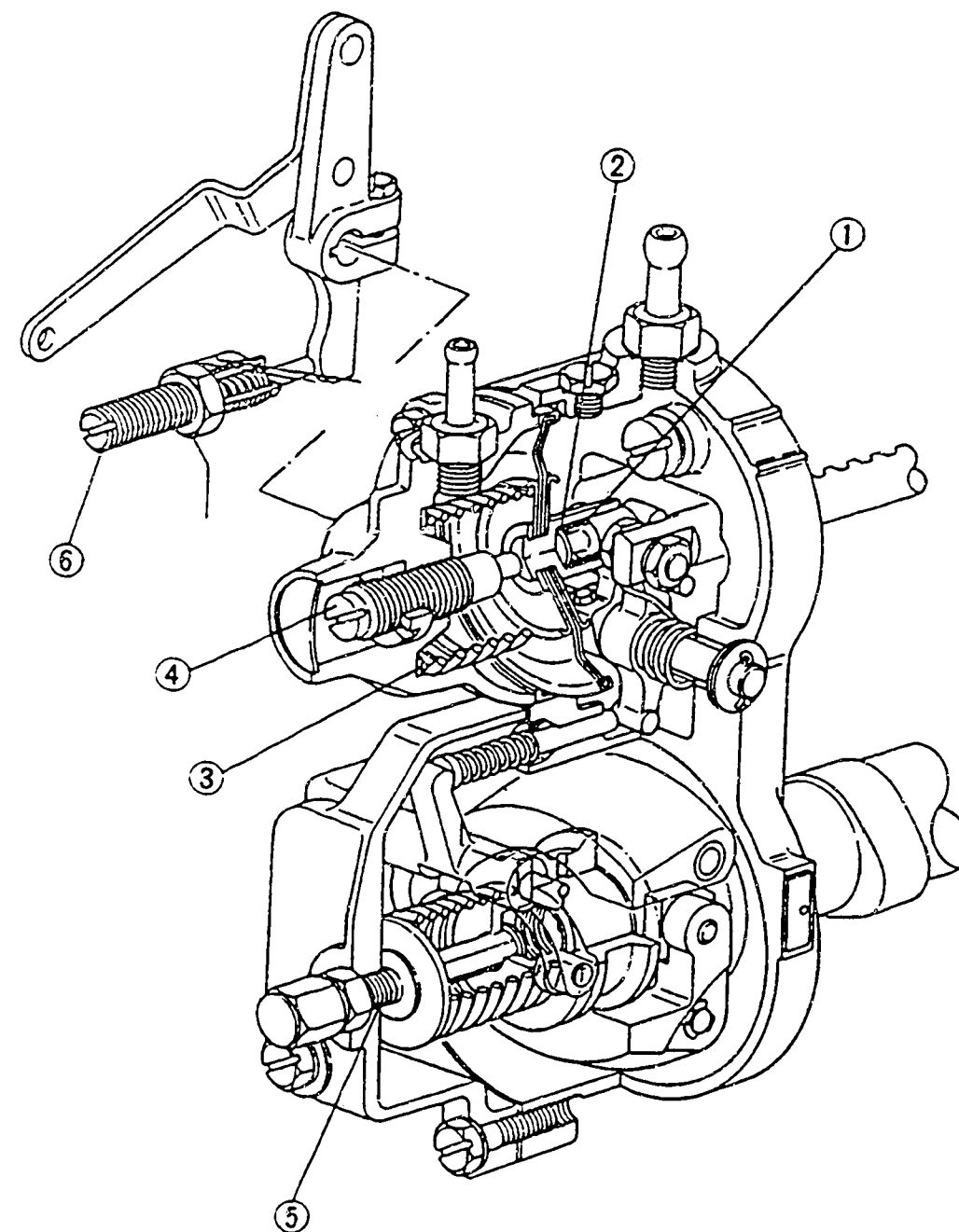


Fig. 10

- 1 = Shim
- 2 = Shim
- 3 = Shim
- 4 = Spring capsule
- 5 = Screw
- 6 = Spring capsule

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**B19**

ZEXEL - Test values  
Injections pumps



**B20**

ZEXEL - Test values  
Injections pumps



■ FINAL ADJUSTMENT

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Smoke Setting			Fuel Injection Quantity Adjustment		
Pump Speed (rpm)	Negative Pressure (mmAq)	Injection Q'ty (cc/1000st)	Pump Speed (rpm)	Negative Pressure (mmAq)	Injection Q'ty (cc/1000st)
1000	10.3	28.8 - 30.8			

■ TIMING SETTING

At No. 4 plunger's beginning of injection position.

B.T.D.C.: 18°

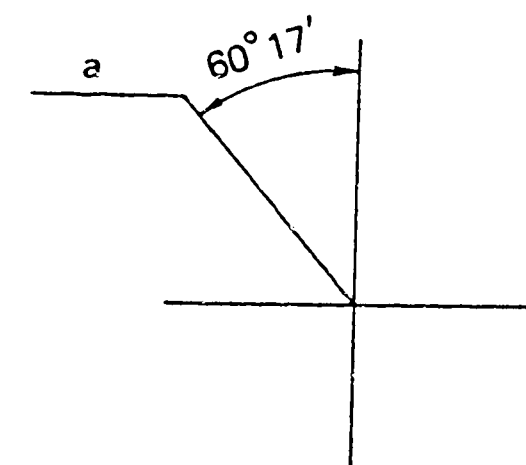


Fig. 11

Pump center line

a = Mark "Z"

**B21**

ZEXEL - Test values  
Injections pumps



**B22**

ZEXEL - Test values  
Injections pumps



# ZEXEL - TEST VALUES Injections pumps

BOSCH No.	:	9 400 610 101	1/4
ZEXEL No.	:	101631-9803	
Date	:	31.10.1990	[5]
Company	:	NISSAN DIESEL	
Engine	:	SD33 / 16700 C8600	

IP-Type number	:	101063-9371 / PES6A
Governor type number	:	105542-4221 / EP/RBD
		-M2

## TEST PREREQUISITES

Test oil	:	ISO-4113
Test oil inlet temperature °C	:	40.00...45.00
Inlet pressure bar	:	1.6
Test nozzle holder combination	:	1 688 901 013
Opening pressure bar	:	175
Test pressure line		
Inner x Outer Dia - Length mm	:	2.00 x 6.00 x 600

## PORT CLOSING

Prestroke	mm	:	2.15 ± 0.05
Rod position	mm	:	-
Port closing mark Cyl. No.	:	:	-
Cam sequence	:	:	1-4-2-6-3-5
Port closing mark Cyl. No.	:	:	-
Port closing difference °NW	:	:	0-60-120-180-240-300
Tolerance	+- °C	:	0.50 (0.75)



Injection Quantity :

Adjusting Point	Rod Pos. (mm)	Speed (rpm)	Injection Q'ty (cc/1000 str.)	Difference (%)	Fixed	Remarks
	12.6	800	33.0 - 35.0	± 2.5	Rack	Basic
	12.3	1900	(36.5 - 39.7)	± 4	Rack	
	approx. 8.6	300	6.5 - 8.5	± 15	Rack	

Timing Advance Specification : EP/SCD  
105622-1100

Speed (rpm)	500	1100	1900				
Advance Angle (deg)	Below 0.5	1.2-2.2	5.5-6.5				

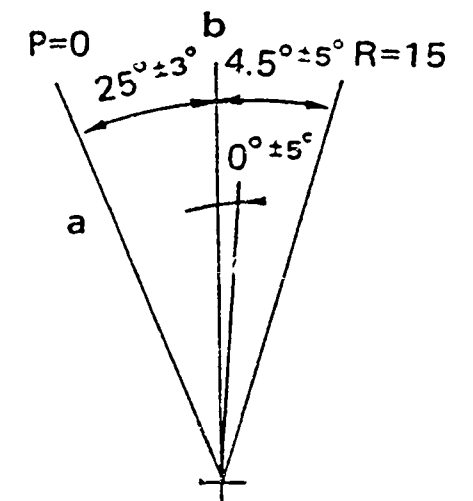
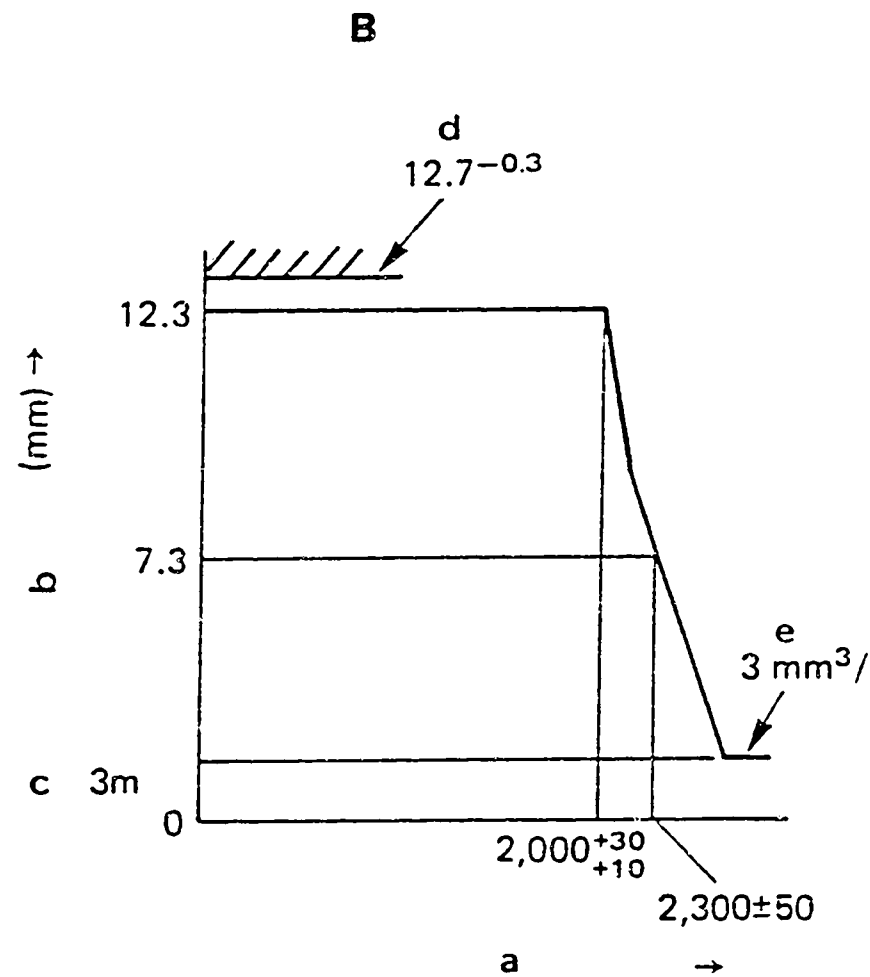
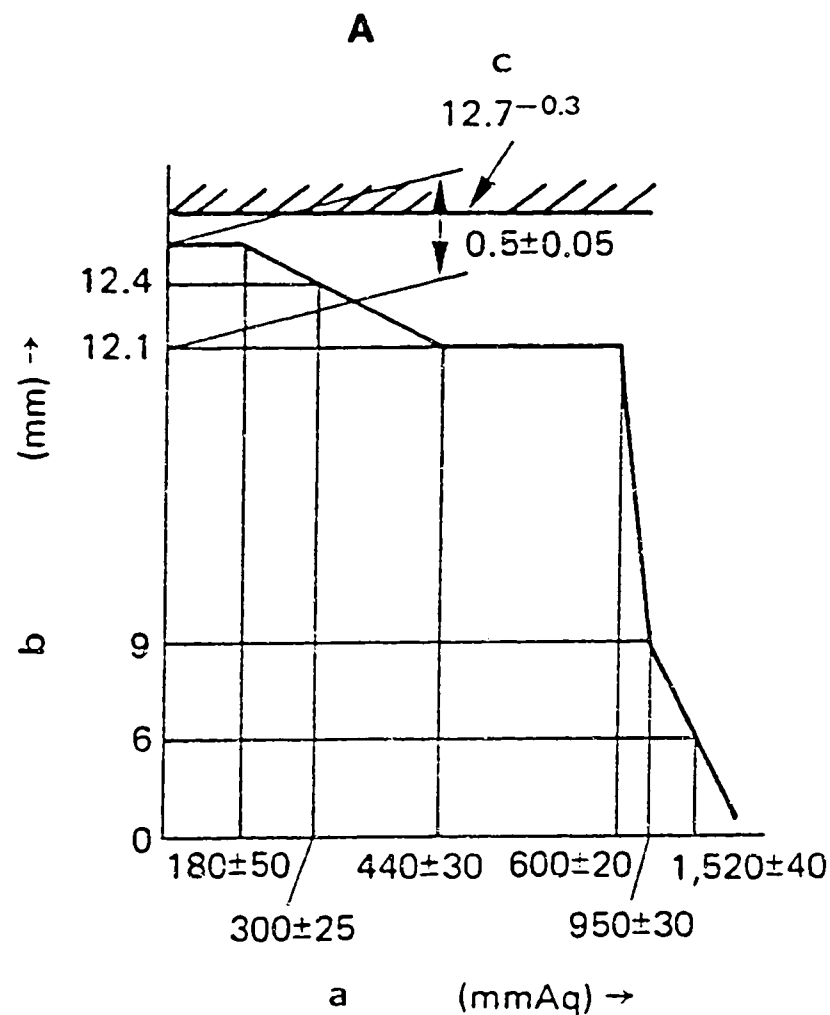


Fig. 12

# GOVERNOR ADJUSTMENT

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A = Pneumatic Governor

B = Mechanical Governor

a = Negative pressure  
b = Control rack position  
c = Rack limit

a = Pump speed (rpm)  
b = Control rack position  
c = Below  
d = Rack limit  
e = Below /st

a = Stop  
b = Normal

## AIR TIGHTNESS TEST

1. Increase the pressure of the pneumatic governor's negative pressure chamber to 500 mmAq at a pump speed of 500 rpm and a control rack position of approx. 12.6 mm.
2. Then, confirm that it takes 10 seconds or more for the negative pressure to fall from 500 mmAq to 480 mmAq.

C4

ZEXEL - Test values  
Injections pumps



C5

ZEXEL - Test values  
Injections pumps



## ■ ADJUSTMENT

## A) Pneumatic Governor (Pump Speed: 500 rpm)

	Negative Pressure (mmHg)	Rack Position (mm)	Remarks
Smoke Set Screw Adjustment	0	12.6	• Adjust using spring capsule (6)
Torque Control Adjustment			
1) Start of torque control spring movement	410 - 470	12.6	• Adjust thickness of shim (1)
2) End of torque control spring movement	approx. 180	12.6	• Adjust thickness of shim (2)
3) Confirm	-	-	
4) Confirm torque control stroke	-	-	• Inspection: 0.4 - 0.6 mm
High-speed Control Adjustment	580 - 620	12.1	• Adjust thickness of shim (3)
Idling Adjustment	920 - 980	9.0	• Adjust using spring capsule (4)
	approx. 1520	6.0	• Confirm

## B) Mechanical Governor (Negative pressure: 580 - 620 mmHg)

	Pump speed (rpm)	Rack Position (mm)	Remarks
Maximum Speed Control Adjustment	2010 - 2030	12.3	• Adjust using screw (5)
	2250 - 2350	7.3	• Confirm
	approx. 2600	below 3	• Confirm (Check the fuel injection quantity: below 3 cc/1000st)

C6

ZEXEL - Test values  
Injections pumps

C7

ZEXEL - Test values  
Injections pumps

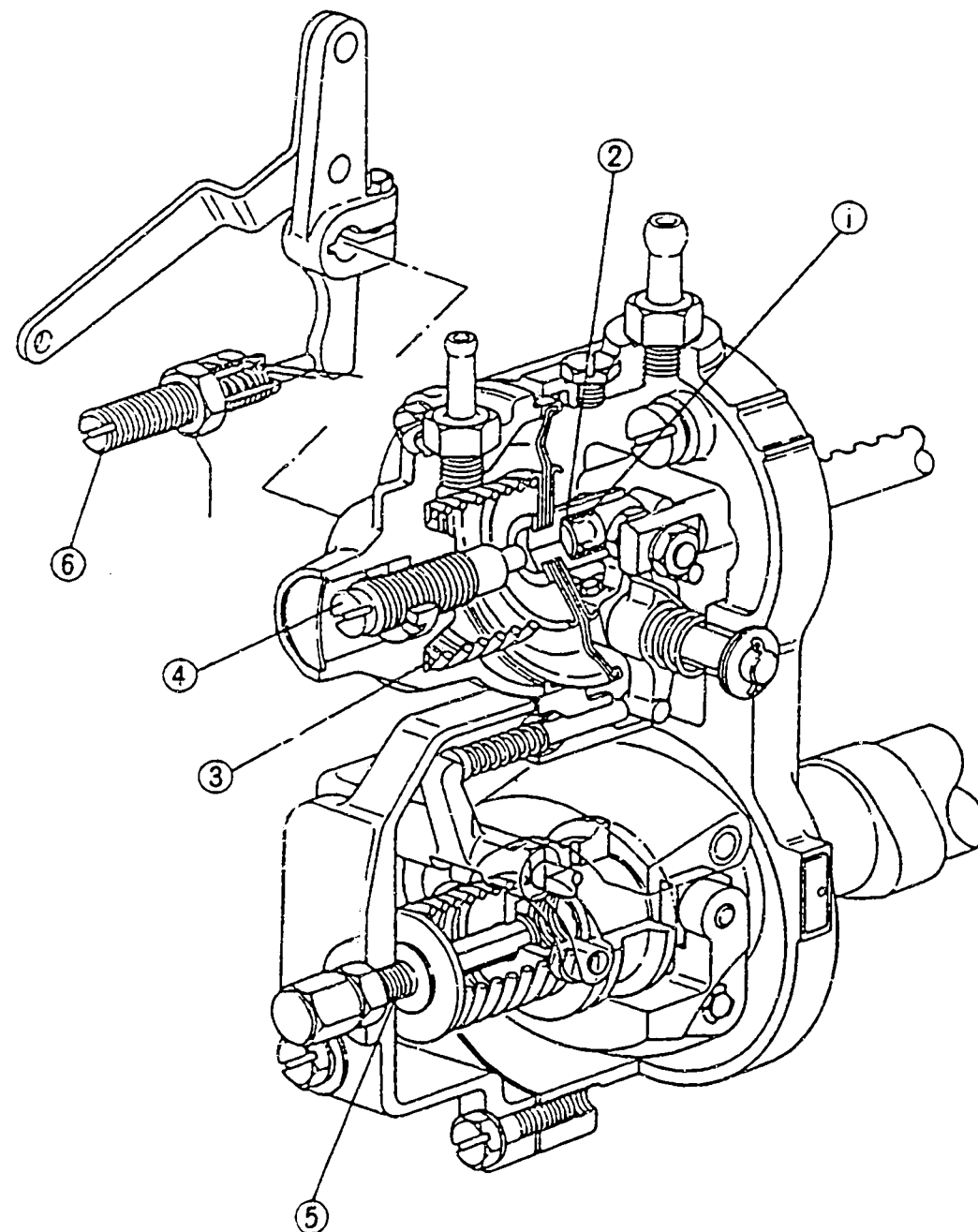


Fig. 13

- 1 = Shim
- 2 = Shim
- 3 = Shim
- 4 = Spring capsule
- 5 = Screw
- 6 = Spring capsule

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**C8**

ZEXEL - Test values  
Injections pumps



**C9**

ZEXEL - Test values  
Injections pumps





# FINAL ADJUSTMENT

Smoke Setting			Fuel Injection Quantity Adjustment		
Pump Speed (rpm)	Negative Pressure (mmAq)	Injection Q'ty (cc/1000st)	Pump Speed (rpm)	Negative Pressure (mmAq)	Injection Q'ty (cc/1000st)
1900	12.3	36.5 - 39.7			

## TIMING SETTING

At No. 1 plunger's beginning of injection position.

B.T.D.C.: 20°

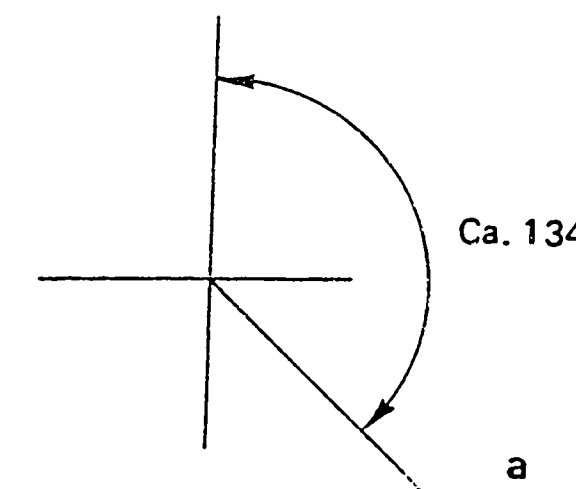


Fig. 14

Pump center line

a = Mark "Y"

C10

ZEXEL - Test values  
Injections pumps



C11

ZEXEL - Test values  
Injections pumps



ZEXEL - TEST VALUES  
Injections pumps

BOSCH No.	:	9 400 610 072	1/3
ZEXEL No.	:	104302-6331	
Date	:	31.10.1990	[4]
Company	:	ISUZU	
Engine	:	2AA1A / 515601-1770	

IP-Type number	:	104300-0261 / PES2K
Governor type number	:	

TEST PREREQUISITES

Test oil	:	ISO-4113
Test oil inlet temperature °C	:	40.00...45.00
Inlet pressure bar	:	1.6
Test nozzle holder combination	:	1 688 901 013
Opening pressure bar	:	175
Test pressure line		
Inner x Outer Dia - Length mm	:	2.00 x 6.00 x 600

PORT CLOSING

Prestroke	mm	:	2.1 ± 0.05
Rod position	mm	:	-
Port closing mark Cyl. No.	:	:	-
Cam sequence	:	:	1 - 2

Port closing mark Cyl. No.	:	-
Port closing difference °NW	:	0-90

Tolerance	+ - °C:	0.50 (0.75)
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Continued (Test values)

**Injection Quantity :**

Adjusting Point	Rod Pos. (mm)	Speed (rpm)	Injection Q'ty (cc/1000 str.)	Difference (%)	Fixed	Remarks
A	8.5	1050	33.5 - 35.5	± 2.5	Lever	Basic
B	approx. 5.1	350	5.3 - 7.3	± 14	Rack	

**Timing Advance Specification :**

Speed (rpm)							
Advance Angle (deg)							

**C13**

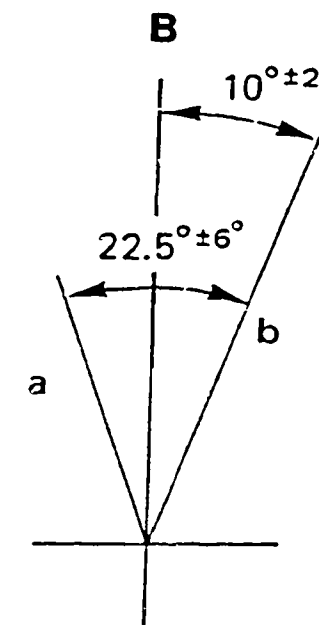
ZEXEL - Test values  
Injections pumps



**C14**

ZEXEL - Test values  
Injections pumps





GOVERNOR ADJUSTMENT

B = Speed Control Lever Angle

```
a = Idling
b = Full-speed
```



## ■ ADJUSTMENT

	Pump speed (rpm)	Rack position (mm)	Remarks
Full-Load Stopper Bolt Adjustment	1050 1050	8.5 8.5	<ul style="list-style-type: none"> <li>• Adjust using screw (1)</li> <li>• Confirm injection quantity at point A.</li> <li>• Confirm the control lever angle (<math>8^{\circ}</math> - <math>12^{\circ}</math>)</li> </ul>
Maximum Speed Adjustment	Fix the control lever in the full-speed position		
	1095 - 1105 Below 1275	8.5 (4.1)	<ul style="list-style-type: none"> <li>• Adjust using screw (2)</li> <li>• Confirm</li> </ul>
Idling adjustment	350	(5.1)	<ul style="list-style-type: none"> <li>• Adjust using idling spring guide (3)</li> <li>• Confirm</li> </ul>
	0	Above (7.1)	

C17

ZEXEL - Test values

Injections pumps



C18

ZEXEL - Test values

Injections pumps



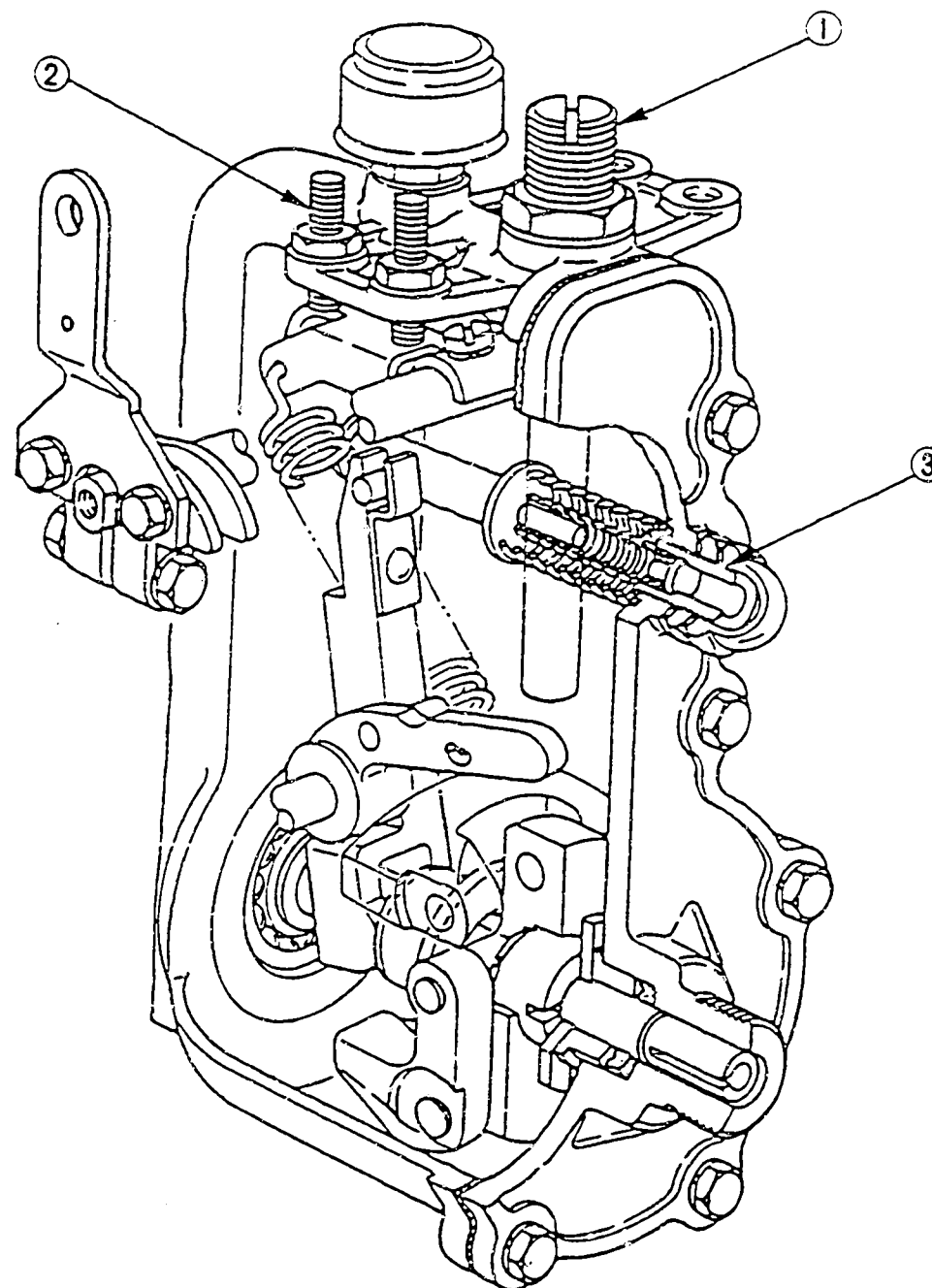


Fig. 16

- 1 = Screw
- 2 = Screw
- 3 = Idling spring guide

104302-6331 3/3

**C19**

ZEXEL - Test values  
 Injections pumps



**C20**

ZEXEL - Test values  
 Injections pumps



ZEXEL - TEST VALUES  
Injections pumps

BOSCH No.	:	9 400 610 086	1/3
ZEXEL No.	:	104302-6420	
Date	:	31.10.1990	[2]
Company	:	MAZDA	
Engine	:	S126 /2251-2501-02-0	

IP-Type number	:	104300-0540 / PES2K
Governor type number	:	

TEST PREREQUISITES

Test oil	:	ISO-4113
Test oil inlet temperature °C	:	40.00...45.00
Inlet pressure	bar :	1.6
Test nozzle holder combination	:	1 688 901 013
Opening pressure	bar :	175
Test pressure line		
Inner x Outer Dia - Length	mm :	2.00 x 6.00 x 600

PORT CLOSING

Prestroke	mm :	1.95 ± 0.05
Rod position	mm :	-
Port closing mark	Cyl. No. :	-
Cam sequence	:	1 - 2

Port closing mark	Cyl. No. :	-
Port closing difference	°NW :	0 - 90

Tolerance	+ - °C:	0.50 (0.75)
-----------	---------	-------------



Injection Quantity :

Adjusting Point	Rod Pos. (mm)	Speed (rpm)	Injection Q'ty (cc/1000 str.)	Difference (%)	Fixed	Remarks
A	8.0	1250	40.0 - 42.0	± 3	Lever	Basic
B	approx. 6.3	350	5.0 - 7.0	± 14	Lever	
C	8.4	1000	44.0	-	Lever	

Timing Advance Specification :

Speed (rpm)							
Advance Angle (deg)							





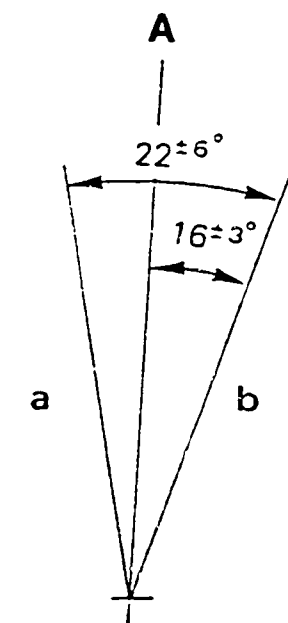
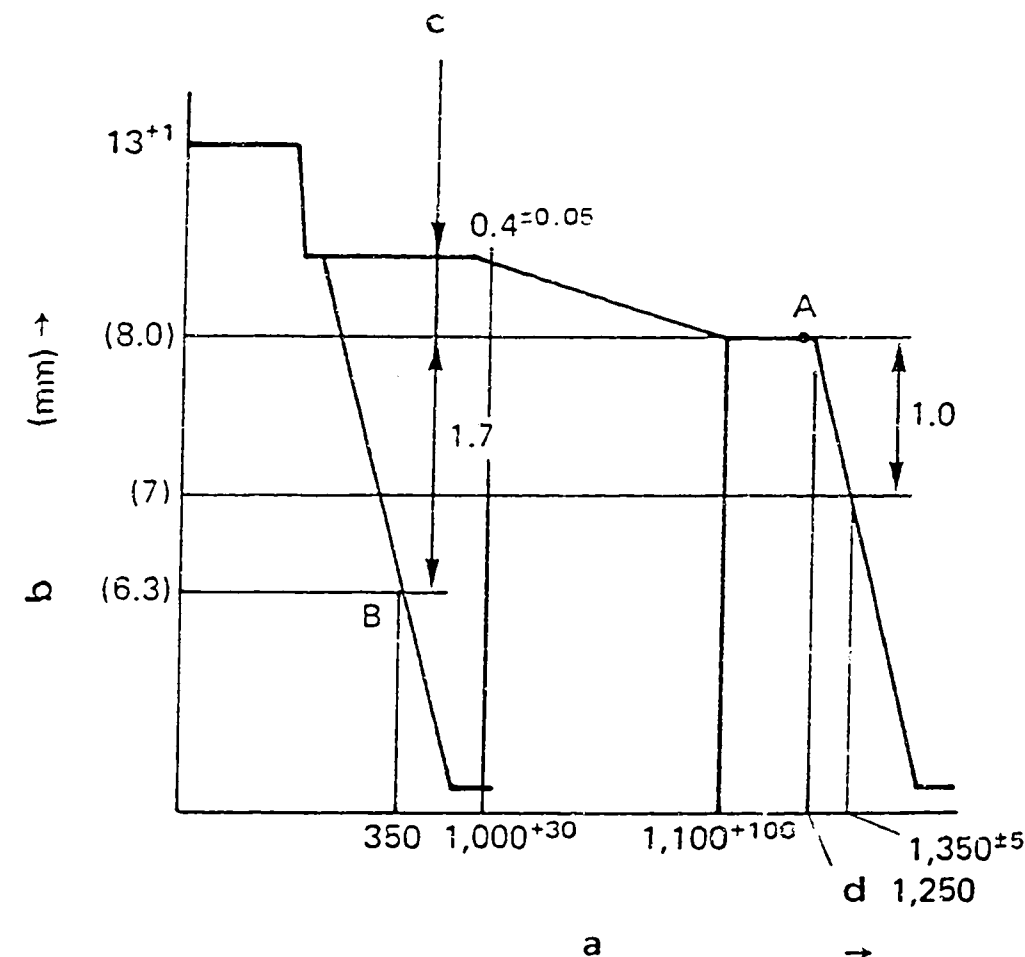


Fig. 17

# GOVERNOR ADJUSTMENT

104302-6420 2/3

- a = Pump speed (rpm)
- b = Control rack position
- c = Difference in control rack positions  
between 1250 rpm and 1000 rpm
- d = Above

A = Speed Control Lever Angle

- a = Idling
- b = Full-speed

D4

ZEXEL - Test values  
Injections pumps



D5

ZEXEL - Test values  
Injections pumps



## ■ ADJUSTMENT

	Pump Speed (rpm)	Rack Position (mm)	Remarks
Full-load Adjustment (temporary)	1250 1250	8.0 8.0	<ul style="list-style-type: none"> <li>• Adjust using screw (1)</li> <li>• Confirm injection quantity at point A</li> <li>• Confirm the control lever angle (<math>13^{\circ}</math> - <math>19^{\circ}</math>)</li> </ul>
Maximum Speed Adjustment	Fix the control lever in the full-speed position		
	1345 - 1355 Above 1250	(7.0) 8.0	<ul style="list-style-type: none"> <li>• Confirm</li> <li>• Adjust using screw (2)</li> </ul>
Idling Adjustment	350  1250  0	(6.3)  8.0  $13^{+1}$	<ul style="list-style-type: none"> <li>• Adjust using idling spring guide</li> <li>• Confirm injection quantity at point A</li> <li>• Confirm</li> </ul>
Stopper bolt Adjustment	100	(6.3) -1	<ul style="list-style-type: none"> <li>• Adjust using screw (3)</li> </ul>
Torque Control Spring Adjustment	Above 1250 1000 - 1030 Approx. 1100	8.0 8.3 - 8.5 8.0	<ul style="list-style-type: none"> <li>• Move the control lever</li> <li>• Adjust using screw (4)</li> <li>• Torque control stroke 1 mm is adjusted by shims.</li> <li>• Confirm the torque control stroke is 0.4 mm.</li> </ul>

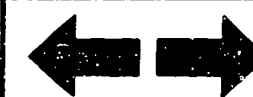
D6

ZEXEL - Test values  
Injections pumps



D7

ZEXEL - Test values  
Injections pumps



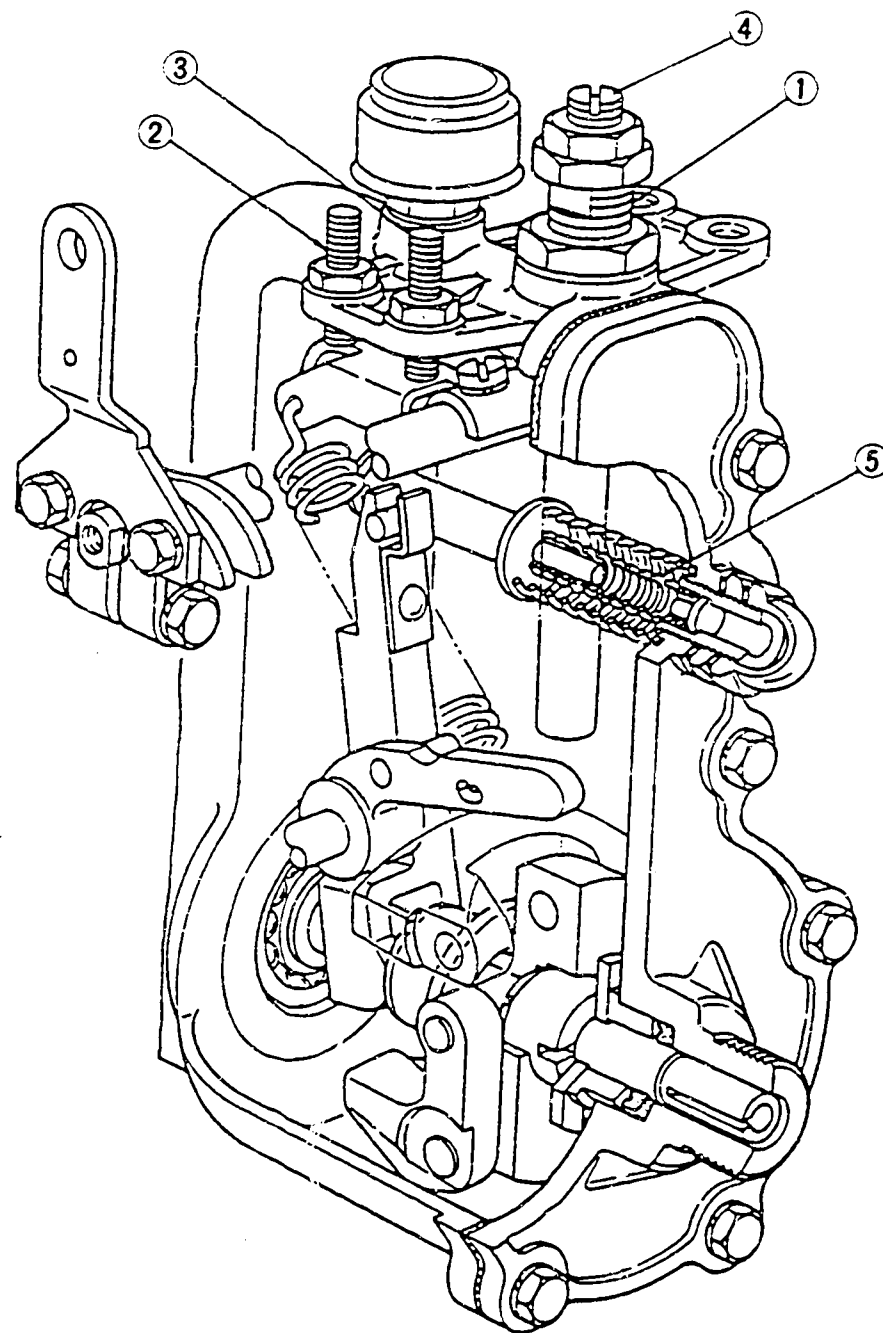


Fig. 18

- 1 = Screw
- 2 = Screw
- 3 = Screw
- 4 = Screw
- 5 = Idling spring guide

104302-6420 3/3

**D8**

ZEXEL - Test values  
Injections pumps



**D9**

ZEXEL - Test values  
Injections pumps



BOSCH No.	9 460 610 424
ZEXEL No.	104740-0363
Date:	31.10.1990 [0]
Company:	MAZDA
No.	47831 3800C

Test pressure line:  
1 680 750 017

2. Test values

### 3. Dimensions

Control lever angle[illegible]D 10

D11

Test oil:  
ISO 4113 or  
SAE J967d

ZEXEL - VALUES  
Distributors pumps  
Engine model: PN

1/3  
BOSCH No. 9 460 610 448  
ZEXEL No. 104740-0422  
Date: 31.10.1990[0]  
Company: MAZDA  
No. PN4613800B

Injection pump no.: 104640-0394 (NP-VE4/10F2350RNP803)

Pump rot.: clockwise-viewed from drive side

Test-nozzle holder combination:  
1 688 901 000

Test pressure line:  
1 680 750 017

1. Setting values		Speed (rpm)	Setting values	Charge air pressure (mmHg)	Difference in delivery (cc)
1-1	Timing device travel	1500	6.0 - 6.4 (mm)		2.5
1-2	Supply pump pressure	1500	5.3 - 5.7 (kg/cm <sup>2</sup> )		
1-3	Full load deliv. without charge-air pr. Full load deliv. with charge-air press.	1500	31.3 - 32.3 (cc/1000st) (cc/1000st)		
1-4	Idle speed regulation	410	6.0 - 8.0 (cc/1000st)		4.0
1-5	Start	100	60.0 - 80.0 (cc/1000st)		
1-6	Full-load speed regulation	2635	10.4 - 14.4 (cc/1000st)		
1-7	Load timer adjustment	1000	TA = 1.7-2.1 (mm)		
1-8					

## 2. Test values

2-1 Timing device	N = rpm mm	500	875	1000	1500	2250	2350
		below 1.0	1.5-2.7	2.5-3.3	5.9-6.5	8.6-10.4	9.4-10.2
2-2 Supply pump	N = rpm kg/cm <sup>2</sup>	1500			2350		
		5.3-5.7			7.3- 7.9		
2-3 Overflow delivery	N = rpm cc/10s	1500			51-95		

## 2-4 Fuel injection quantities

Control lever position	Speed (rpm)	Fuel delivery (cc/1000st)	Charge-air pres (mmHg)	Difference in delivery (cc)
End stop	1500	30.8 - 32.8		
	1000	28.2 - 32.2		
	2350	27.1 - 33.1		
	2635	9.9 - 14.9		
	2850	below 5.0		
Switch off	410	0		
Idle stop	410	6.0 - 8.0		
	500	below 3.0		

2-5  
Solenoid  
Cut-in voltage max.: 8 V  
Test voltage: 12 - 14 V

## 3. Dimensions

K	3.2 - 3.4 mm
KF	5.62 - 5.82 mm
MS	1.1 - 1.3 mm
LDA	- mm
Full st.	2.78 mm

## Control lever angle

α	21 - 29 deg
A	4.1 - 7.7 mm
β	38 - 48 deg
B	12.8 - 15.8 mm
γ	- deg
C	- mm

D12

ZEXEL - Test values  
Injections pumps



D13

ZEXEL - Test values  
Injections pumps



1. Adjustment

1) Fix the control lever in the position satisfying the following conditions:

Boost Pressure: - mmHg  
 Pump Speed : 1000 rpm  
 Fuel Injection  
 Quantity : 19.5 - 20.5 cc/1000st

2) With the control lever positioned as described in 1) above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values.

2. Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Control lever position			Specified values	
Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)
1000	19.0 - 21.0	-		1.6 - 2.2
1000	8.5 - 11.5	-		0.5 - 1.9

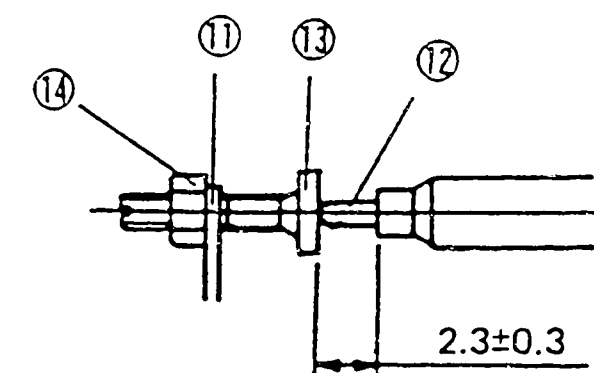


Fig. 19

■ DASHPOT ADJUSTMENT

1. Fix the control lever (11) in the idling position.

2. Adjust the screw (13) so that the pushrod (12) protuder  $2.3 \pm 0.3$  mm.



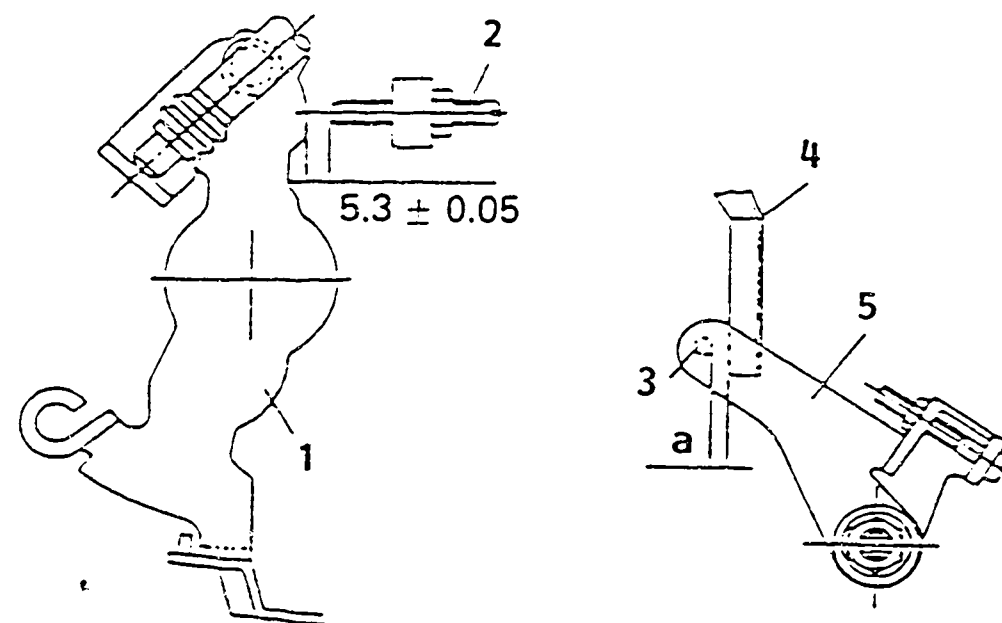


Fig. 20

- 1 = Control lever
- 2 = Idling stopper bolt
- 3 = Pin

- 4 = Control lever
- 5 = Fast idling lever
- a = Gap

#### W-CSD ADJUSTMENT

#### 1. Timer stroke adjustment (refer to Figs. 20 and 21)

- 1) Using the graph (Fig. 21), determine the timer stroke according to the the atmospheric temperature at the time of adjustment.
- 2) Adjust using the timer stroke adjusting bolt so that the timer stroke corresponds to the value determined in note 1) above.

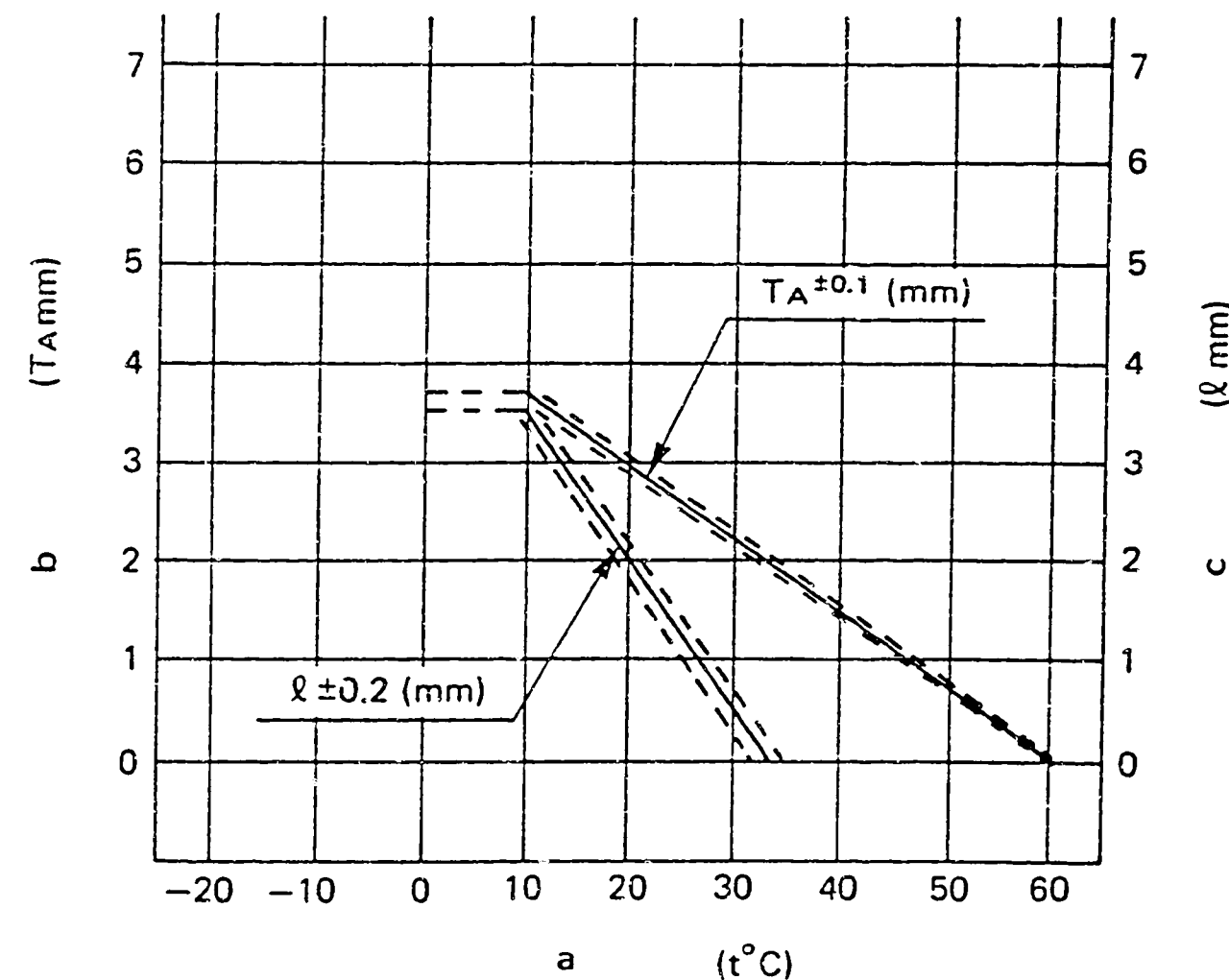


Fig. 21

104740-0422 3/3

- a = Atmospheric temperature
- b = Timer stroke
- c = Control lever



(Continued)

2. Fast Idle Adjustment (Refer to Figs. 20 and 21)

- 1) Insert a block gauge of 1 mm thickness in the gap between the control lever and the idling stopper bolt.
- 2) From Fig. 21 determine the dimension of the gap between the idling lever pin and the control lever according to the atmospheric temperature at the time of adjustment.
- 3) Adjust using the fast idle adjusting screw so that the gap corresponds to the value determined in note 2) above.





Test oil:  
ISO 4113 or  
SAE J967d

# ZEXEL-TEST VALUES Distributor pumps Engine model: AD23

1/2

BOSCH No. 9 460 610 416  
ZEXEL No. 104740-9541  
Date: 31.10.1990 [3]  
Company: NISSAN DIESEL  
No. 16700 02N70

Injection pump no.: 104640-9541 (NP-VE4/10F2150RNP537)

Pump rot.: clockwise-viewed from drive side Test-nozzle holder combination:  
1 688 901 000

Test pressure line:  
1 680 750 017

1. Setting values	Speed (rpm)	Setting values	Charge-air pressure bar (mmHg)	Difference (cc)
1-1 Time device travel	1100	2.3 - 2.7 (mm)		
1-2 Supply pump pressure	1100	3.5 - 4.1 (kg/cm <sup>2</sup> )		
1-3 Full load deliv. without charge air pre	1100	44.1 - 45.1 (cc/1000st)		3.0
Full load deliv. with charge air press.		(cc/1000st)		
1-4 Idle speed regulation	350	4.5 - 8.5 (cc/1000st)		2.0
1-5 Start	100	45.0 - 80.0 (cc/1000st)		
1-6 Full-load speed regulation	2350	28.3 - 32.3 (cc/1000st)		

## 2. Test values

	Solenoid timer	ON	OFF	
2-1 Timing device	N = rpm mm	1100 3.7 - 4.7	1100 1700 2500	2.2-2.8 4.1-5.1 6.4-7.4
2-2 Supply pump	N = rpm kg/cm <sup>2</sup>		1100 1700 2150	3.5-4.1 4.9-5.5 5.8-6.4
2-3 Overflow delivery	N = rpm cc/10s	1100 43.0 - 87.0		

## 2-4 Fuel delivery quantities

Speed control lever pos.	Speed (rpm)	Fuel delivery (cc/1000st)	Charge-air pres (mmHg)	Difference (cc)
End stop	1100 600 2150 2350 2550 2700	43.6 - 45.6 41.5 - 45.5 35.9 - 40.1 27.8 - 32.8 5.3 - 12.4 below 5.0		
Switch off	350	0		
Idle-stop	350 450	4.5 - 8.5 below 2.0		

2-5 Solenoid Cut-in voltage max.: 8 V  
Test voltage: 12 - 14 V

## 3. Dimensions

K 3.2 - 3.4 mm  
KF 5.7 - 5.9 mm  
MS 0.9 - 1.1 mm  
BCS - mm  
Prest. - mm

## Control lever angle

α 50 - 58 deg  
A 23.7 - 28.3 mm  
β 37 - 47 deg  
B 10.7 - 14.8 mm  
γ - deg  
C - mm

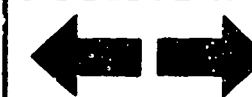
D19

ZEXEL - Test values  
Injections pumps



D20

ZEXEL - Test values  
Injections pumps



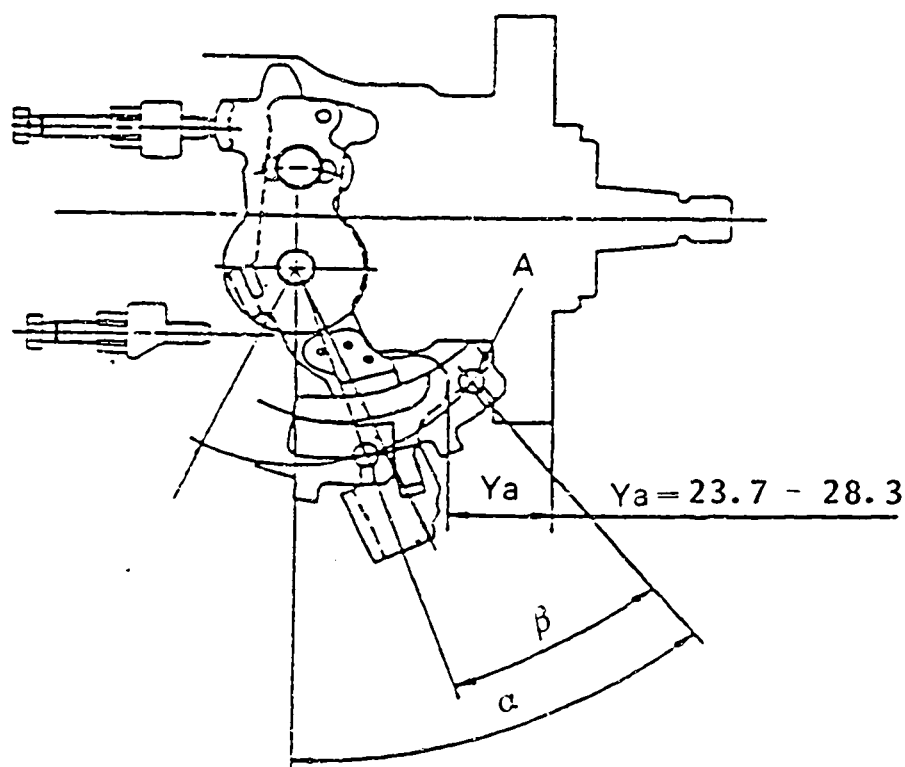


Fig. 22

104740-9541 2/2

### ■ Control Lever Angle Measurement Position

- 1) Measure the control lever angles ( $\alpha$ ,  $\beta$ ,  $\gamma$ ) at hole A.

### Note

- If there is no designation in the specifications for the Solenoid Timer's ON - OFF position, then the position should be regarded as OFF.



Test oil:  
ISO 4113 or  
SAE J967d

ZEXEL - TEST VALUES  
Distributors pumps  
Engine model: TD25

1/2

BOSCH No. 9 460 610 444  
ZEXEL No. 104740-9623  
Date: 31.10.1990 [2]  
Company: NISSAN DIESEL  
No. 16700 44G03

Injection pump no.: 104640-9623

(NP-VE4/10F2150RNP663)

Pump rot.: clockwise-viewed from drive side

Test-nozzle holder combination:  
1 688 901 000

Test pressure line:  
1 680 750 017

1. Setting values		Speed (rpm)	Setting values	Charge-air pressure bar (mmHg)	Difference (cc)
1-1	Timing device travel	1700	4.7 - 5.1 (mm)		3.0
1-2	Supply pump pressure	1700	5.6 - 6.2 (kg/cm <sup>2</sup> )		
1-3	Full load deliv. without charge-air pr. Full load deliv. with charge-air pres.	1100	48.0 - 49.0 (cc/1000st) (cc/1000st)		
1-4	Idle speed regulation	350	4.5 - 8.5 (cc/1000st)		2.0
1-5	Start	100	45.0 - 80.0 (cc/1000st)		
1-6	Full-load speed regulation	2500	10.1 - 14.1 (cc/1000st)		
1-7	Load-timer adjustment				
1-8					
2. Test values					
2-1 Timing device		N = rpm mm	1100 2.0 - 3.2	1700 4.6 - 5.2	2300 6.0 - 7.0
2-2 Supply pump		N = rpm kg/cm <sup>2</sup>	1100 4.1 - 4.7	1700 5.6 - 6.2	2150 6.6 - 7.2
2-3 Overflow delivery		N = rpm cc/10s	1100 43.0 - 87.0		
2-4 Fuel injection quantities					
Control lever position		Speed (rpm)	Fuel delivery (cc/1000 strokes)	Charge-air pres (mmHg)	Difference (cc)
End stop		1100	47.5 - 49.5		
		600	45.1 - 49.1		
		2150	38.5 - 47.8		
		2300	28.3 - 37.3		
		2500	9.6 - 14.6		
		2700	below 5.0		
Switch off		350	0		
Idle		350	4.5 - 8.5		
stop		450	below 3.0		
2-5 Solenoid		Cut-in voltage max.: 8 V Test voltage: 12 - 14 V			

3. Dimensions	
K	3.2 - 3.4 mm
KF	5.7 - 5.9 mm
MS	0.9 - 1.1 mm
BCS	- mm
Pre-st	- mm
Control lever angle	
α	51.5 - 59.5 deg
A	24.3 - 28.7 mm
β	31° - 41° deg
B	9.3 - 12.9 mm
γ	- deg
C	- mm

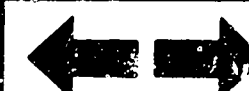
D22

ZEXEL - Test values  
Injections pumps



D23

ZEXEL - Test values  
Injections pumps



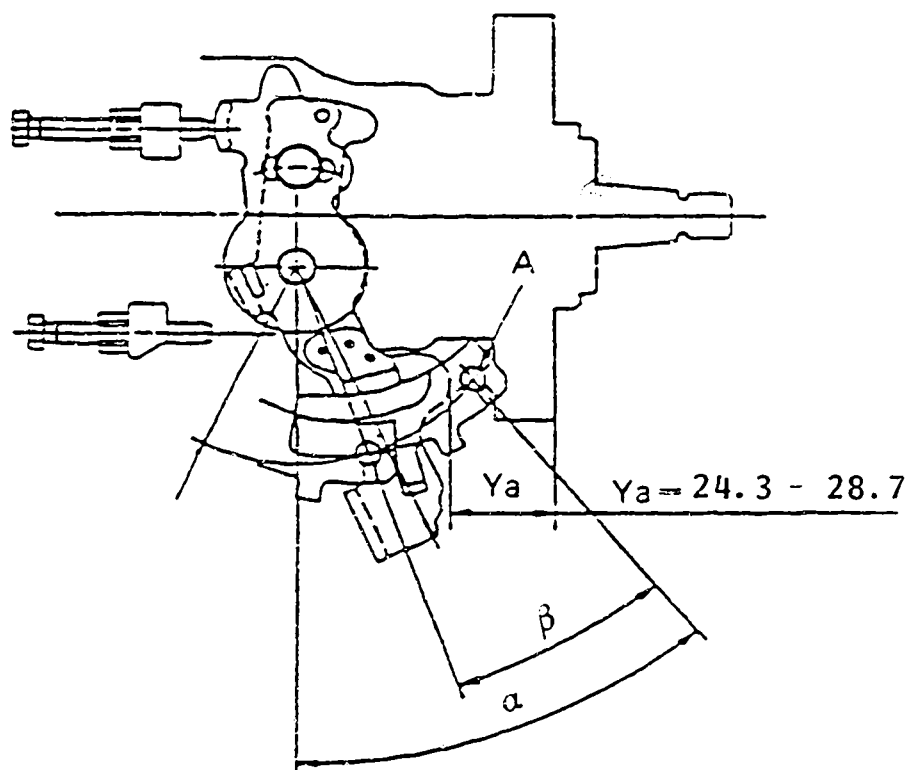


Fig. 23

104740-9623 2/2

# ■ Control Lever Angle Measurement Position

- 1) Measure the control lever angles ( $\alpha$ ,  $\beta$ ,  $\gamma$ ) at hole A.

## Note

- If there is no designation in the specifications for the Solenoid Timer's ON - OFF position, then the position should be regarded as OFF.



Test oil  
ISO 4113 or  
SAE J967d

ZEXEL-TEST VALUES  
Distributor pumps  
Engine model: TD25

1/2  
BOSCH No. 9 460 610 445  
ZEXEL No. 104740-9782  
Date: 31.10.1990 [1]  
Company: NISSAN DIESEL  
No. 16700 21T12

Injection pump no.: 104640-9782

(NP-VE4/10F2150RNP682)

Pump rot.: clockwise viewed from drive side

Test-nozzle holder combination:  
1 688 901 000

Test pressure line:  
1 680 750 017

1. Setting values		Speed (rpm)	Setting values	Charge-air pressure bar (mmHg)	Difference (cc)
1-1	Timing device travel	1100	S/T ON 3.9 - 4.7 (mm) OFF 2.4 - 2.8 (kg/cm <sup>2</sup> )	*) S/T = Solenoid timer	3.0
1-2	Supply pump pressure	1100	S/T ON 4.5 - 5.3 (mm) OFF 3.5 - 4.1 (kg/cm <sup>2</sup> )		
1-3	Full load deliv. without charge air pre Full load deliv. with charge air press.	1100	48.0 - 49.0 (cc/1000st) (cc/1000st)		
1-4	Idle speed regulation	350	4.5 - 8.5 (cc/1000st)		
1-5	Start	100	45.0 - 80.0 (cc/1000st)		
1-6	Full-load speed regulation	2500	10.1 - 14.1 (cc/1000st)		
1-7	Load-timer adjustment				

2. Test values

	Solenoid timer N = rpm mm	ON		OFF		
		1100		1100	1700	2300
2-1 Timing device		3.8-4.8		2.3-2.9	4.3-5.5	6.0-7.0
2-2 Supply pump	N = rpm kg/cm <sup>2</sup>	1100 4.5-5.3	1700 5.9-6.7	1100 3.5-4.1	1700 4.9-5.5	2150 5.8-6.4
2-3 Overflow delivery	N = rpm cc/10s	1100 (S/T ON) 43.0 - 87.0		1100 (S/T ON, without O-ring) 60.0 - 103.0		

2-4 Fuel injection quantities

Speed control lever pos.	Speed (rpm)	Fuel delivery (cc/1000st)	Charge-air pres (mmHg)	Difference (cc)
End stop	1100	47.5 - 49.5		
	600	45.1 - 49.1		
	2150	38.5 - 42.8		
	2300	28.3 - 37.3		
	2500	9.6 - 14.6		
	2700	below 5.0		
Switch off	350	0		
Idle- stop	350	4.5 - 8.5		
	450	below 3.0		

2-5 Solenoid  
Cut-in voltage max.: 8 V  
Test voltage: 12 - 14 V

3. Dimensions

K	3.2 - 3.4 mm
KF	5.7 - 5.9 mm
MS	0.9 - 1.1 mm
BCS	- mm
Prestr.	- mm

Control lever angle

α	50 - 58 deg
A	10.7 - 14.2 mm
β	31 - 41 deg
B	9.3 - 12.9 mm
γ	- deg
C	- mm

D25

ZEXEL - Test values  
Injections pumps



D26

ZEXEL - Test values  
Injections pumps



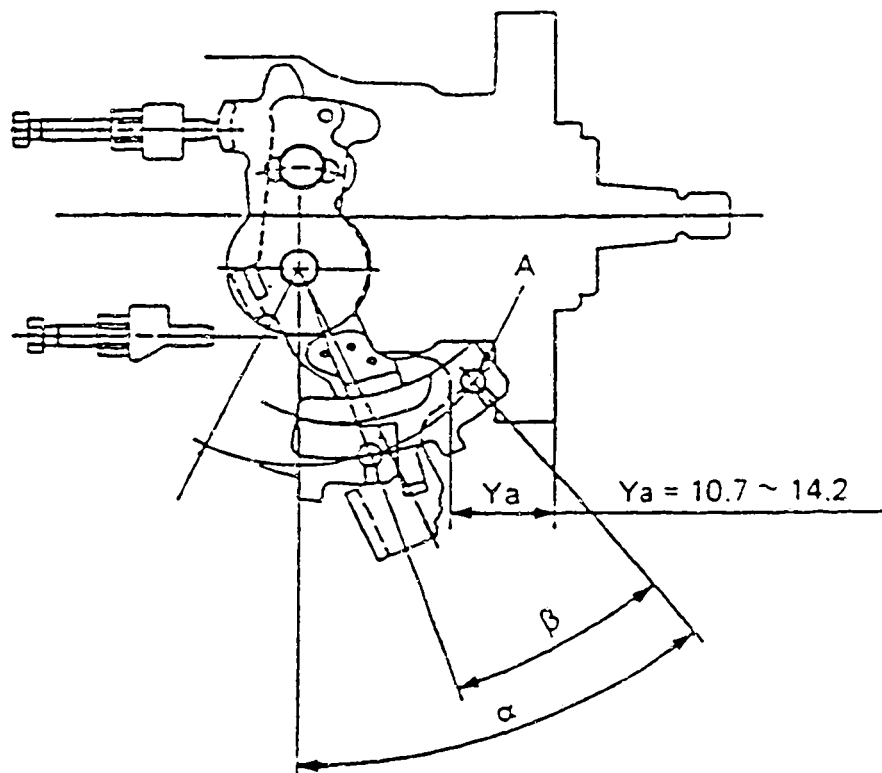


Fig. 24

104740-9782 2/2

### ■ Control Lever Angle Measurement Position

- 1) Measure the control lever angles ( $\alpha$ ,  $\beta$ ,  $\gamma$ ) at hole A.

### Note

- If there is no designation in the specifications for the Solenoid Timer's ON - OFF position, then the position should be regarded as OFF.



Test oil  
ISO 4113 or  
SAE J967d

ZEXEL-TEST VALUES  
Distributor pumps  
Engine model: 4JA1

BOSCH No. 9 460 610 392  
ZEXEL No. 104741-1292  
Date: 31.10.1990 [1]  
Company: ISUZU  
No. 8-94426-850-1

Injection pump no.: 104641-1182 (NP-VE4/11F1900RNP420)

Pump rot.: clockwise viewed from drive side

Test-nozzle holder combination:  
1 688 901 000

Test pressure line:  
1 680 750 017

1. Setting values	Speed (rpm)	Setting values	Charge-air pressure bar (mmHg)	Difference (cc)
1-1 Timing device travel	1550	1.7 - 2.1 (mm)		
1-2 Supply pump pressure	1550	5.1 - 5.5 (kg/cm <sup>2</sup> )		
1-3 Full load deliv. without charge air pre	1000	42.5 - 43.5 (cc/1000st)		3.5
Full load deliv. with charge air press.		(cc/1000st)		
1-4 Idle speed regulation	390	5.5 - 9.5 (cc/1000st)		2.0
1-5 Start	100	75.0 - 105.0 (cc/1000st)		
1-6 Full-load speed regulation	2250	13.1 - 19.1 (cc/1000st)		4.5
1-7 Load-timer adjustment				

## 2. Test values

	Solenoid timer	ON			OFF	
2-1 Timing device	N = rpm mm	690-890 0.5	1400 - 1500 0.5		1550 1.6-2.2	1850 5.3-6.2
2-2 Supply pump	N = rpm kg/cm²	1000 3.1-3.7	1550 5.1-5.5	1850 6.0-6.6		
2-3 Overflow delivery	N = rpm cc/10s	1550 67 - 110				
2-4 Fuel injection quantities						
Speed control lever pos.	Speed (rpm)	Fuel delivery (cc/1000st)	Charge-air pres (mmHg)	Difference (cc)		
End stop	1000	41.1 - 48.1				
	500	35.1 - 42.1				
	700	35.1 - 39.1				
	1350	42.5 - 46.5				
	1700	41.8 - 46.8				
	2000	29.4 - 36.4				
	2250	12.6 - 19.6				
	2350	below 12.1				
Switch off	390	0				
Idle- stop	390	5.5 - 9.5				
	550	below 3.0				
2-5 Solenoid	Cut-in voltage max.: 8 V Test voltage: 12 - 14 V					

## 3. Dimensions

K 2.7 - 2.9 mm  
KF 4.9 - 5.1 mm  
MS 0.9 - 1.1 mm  
BCS - mm  
Prestr. 0.43 - 0.47 mm

### Control lever angle

α 14 - 22 deg  
A 2.5 - 7.6 mm  
β 28 - 38 deg  
B 8.1 - 11.9 mm  
γ - deg  
C - mm

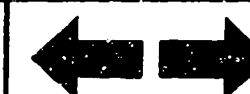
E1

ZEXEL - Test values  
Injections pumps



E2

ZEXEL - Test values  
Injections pumps



Test oil:  
ISO 4113 or  
SAE J967d

ZEXEL - TEST VALUES  
Distributors pumps  
Engine model: 4JA1AG

BOSCH No. 9 460 610 356  
ZEXEL No. 104741-1771  
Date: 31.10.1990 [1]  
Company: ISUZU  
No. 8-94471-053-1

Injection pump no.: 104641-1771

(NP-VE4/11F1900LNP652)

Pump rotation: Counter-clockwise viewed  
from drive side

Test-nozzle holder combination: 1 688 901 000

Test pressure line: 1 680 750 017

1. Setting values	Speed (rpm)	Setting values	Charge-air pressure bar (mmHg)	Difference in delivery (cc)
1-1 Timing device travel	1500	2.1 - 2.5 (mm)		
1-2 Supply pump pressure	1500	5.1 - 5.5 (kg/cm <sup>2</sup> )		
1-3 Full-load deliv. without charge-air pres	1000	39.0 - 40.0 (cc/1000st)		3.0
Full-load deliv. with charge-air press.		(cc/1000st)		
1-4 Idle speed regulation	390	5.5 - 9.5 (cc/1000st)		2.0
1-5 Start	100	75.0 - 105.0 (cc/1000st)		
1-6 Full-load speed regulation	2100	13.1 - 19.1 (cc/1000st)		4.5

## 2. Test values

2-1 Timing device	Solenoid timer	ON			OFF	
	N = rpm	450-650	1200-1300		1500	1950
	mm	0.5	0.5		2.0-2.6	5.3-6.1
2-2 Supply pump	N = rpm	1000	1500		1950	
	kg/cm <sup>2</sup>	3.0 - 3.6	5.1-5.5		6.5-7.1	
2-3 Overflow delivery	N = rpm	1500				
	cc/10s	65.0-108.0				

## 2-4 Fuel injection quantities

Control lever position	Speed (rpm)	Fuel delivery (cc/1000st)	Charge-air pres (mmHg)	Difference in delivery (cc)
End stop	1000	32.5 - 40.5		
	500	32.1 - 40.1		
	700	32.6 - 37.6		
	1350	39.2 - 45.2		
	1800	35.9 - 41.9		
	2000	28.2 - 37.2		
	2100	12.6 - 19.6		
	2300	below 5.0		
Switch off	390	0		
Idle stop	390	5.5 - 9.5		
	550	below 3.0		

2-5 Solenoid Cut-in voltage max.: 8 V  
Test voltage: 12 - 14 V

## 3. Dimensions

K 2.7 - 2.9 mm  
KF 4.9 - 5.1 mm  
MS 0.9 - 1.1 mm  
LDA - mm  
Pre-st. 0.43 - 0.47 mm

## Control lever angle

α 14.0 - 22.0 angle  
A 2.5 - 7.6 mm  
β 32.0 - 42.0 angle  
B 9.3 - 13.2 mm  
γ - angle  
C - mm

E3

ZEXEL - Test values  
Injections pumps



E4

ZEXEL - Test values  
Injections pumps





Test oil:		ZEXEL-TEST VALUES				1/3	
ISO 4113 or		Distributor pumps				BOSCH No. 9 460 610 413	
SAE J967d		Engine model: 4JB1CDT				ZEXEL No. 104741-6850	
						Date: 31.10.1990[0]	
						Company: ISUZU	
						No. 8-97010-946-0	
Injection pump no : 104641-1744		(NP-VE4/11F1900RNP578)					
Pump rotation: clockwise-viewed from drive side		Test-nozzle holder combination: 1 688 901 000				Test pressure line: 1 680 750 017	
1. Test values		Speed (rpm)	Setting values			Charge-air pressure bar (mmHg)	Difference (cc)
1-1	Timing device travel	1700	5.0 - 5.4 (mm)			590 - 610	
1-2	Supply pump pressure	1700	5.2 - 5.6 (kg/cm²)			590 - 610	
1-3	Full-load deliv.without charge air pres	900	50.9 - 51.9 (cc/1000st)			340 - 360	4.5
	Full-load deliv. with charge air press.	1250	59.0 - 61.0 (cc/1000st)			590 - 610	3.5
1-4	Idle speed regulation	385	3.1 - 7.1 (cc/1000st)			0	2.0
1-5	Start	100	60.0 - 100.0 (cc/1000st)			0	
1-6	Full-load speed regulation	2300	19.3 - 25.4 (cc/1000st)			590 - 610	4.5
2. Test values							
		Solenoid timer	ON	OFF			
2-1	Timing device	N = rpm mm	550 above 0.5	1450 2.1-2.9	1700 4.9-5.5	1850 5.8-6.6	
2-2	Supply pump	N = rpm kg/cm²	500 4.0- 6.0	500 above 0.8	1450 4.3-4.9	1700 5.2-5.6	1850 5.6-6.2
2-3	Overflow delivery	N = rpm cc/10s			1700 73 - 150		
2-4 Fuel injection quantities							
Speed control lever pos.		Speed (rpm)	Fuel delivery (cc/1000st)	Charge-air pres (mmHg)	Difference (cc)		
End stop		900	50.4 - 52.4	340 - 360			
		600	33.1 - 41.1	90 - 110			
		750	39.8 - 43.8	170 - 190			
		1250	62.7 - 64.7	590 - 610			
		1800	54.6 - 61.6	590 - 610			
		2300	18.8 - 25.8	590 - 610			
		2500	below 5.0	590 - 610			
Switch off		385	0	0			
Idle stop		385	3.1 - 7.1	0			
		500	below 3.0	0			
2-5 Solenoid		Cut-in voltage max.: 8 V Test voltage: 12 - 14 V					

3. Dimensions		
K	2.7 - 2.9 mm	
KF	5.4 - 5.6 mm	
MS	0.8 - 1.0 mm	
BCS	4.4 - 4.6 mm	
Prestr.	- mm	
Control lever angle		
α	14 - 22 deg	
A	11.3 - 14.7 mm	
β	32 - 42 deg	
B	10.2 - 13.6 mm	
γ	- deg	
C	- mm	

E5

ZEXEL - Test values  
Injections pumps



E6

ZEXEL - Test values  
Injections pumps



# MICROSWITCH ADJUSTMENT SPECIFICATIONS

Injection quantity specifications Boost pressure = 600mmHg(0.81 kg/cm <sup>2</sup> )	
I/P speed (rpm)	Injection quantity (mm <sup>3</sup> /1000st)
1000	26.9 - 28.9

1. Fix the dummy bolt in a position where pump speed is 1000 rpm and injection quantity is 26.9 - 28.9.
2. Move the microswitch in the direction of the arrow from the ON to the OFF position. and fix it in this position.
3. Remove the dummy bolt's fixing bracket and confirm that the microswitch is OFF when it contacts the idle lever, and ON when it contacts the full speed lever.

## Note:

On the pump tester with the lever fixed so that Np and Q are as specified above (using the idle screw or the shim) it is possible to adjust the microswitch without using the dummy bracket.

When using the idle screw, it is necessary to adjust idling after adjusting the micro-switch.

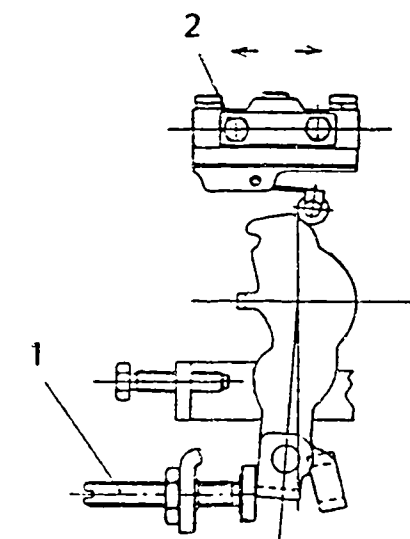


Fig. 25

- 1 = Dummy bolt  
 2 = Micro switch fix bolt  
 (T = 0.2 - 0.3 kg-m)

E7

ZEXEL - Test values  
 Injections pumps



E8

ZEXEL - Test values  
 Injections pumps



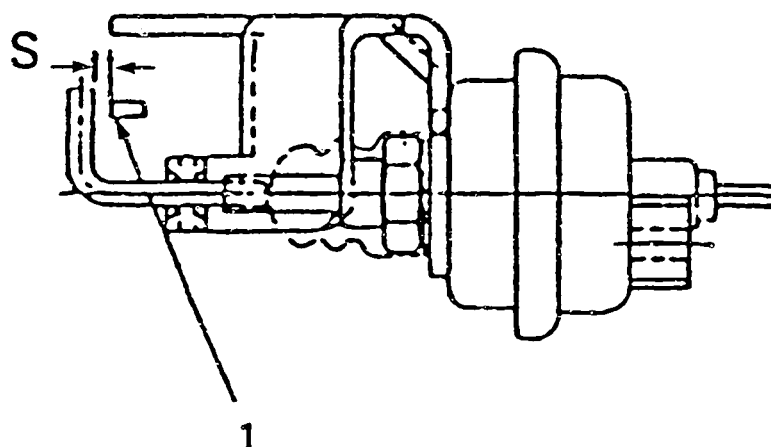


Fig. 26

104741-6850 3/3

1 = Control lever (idle position)

#### ■ V-FICD ADJUSTMENT

1. Adjust the bracket so that the clearance S is  $1 \pm 1$  mm.
2. Apply 400 mmHg negative pressure to the inside of the actuator and confirm that the actuator shaft moves the full stroke.



Test oil:		ZEXEL - TEST VALUES				1/4	
ISO 4113 or		Distributors pumps				BOSCH No. 9 460 610 447	
SAE J967d		Engine model: LD20				ZEXEL No. 104749-2501	
						Date: 31.10.1990 [0]	
						Company: NISSAN	
						No. 16700 05E60	
Injection pump no. 104649-2501		(NP-VE4/9F2500RNP728)					
Pump rot.: clockwise-viewed form drive side							
Test-nozzle holder combination: 1 688 901 000 Test pressure line:1 680 750 017							
1. Setting values		Speed (rpm)	Setting values		Charge-air pressure bar (mmHg)	Difference (cc)	
1-1	Timing device travel	900	1.3 - 1.7 (mm)			2.5	
1-2	Supply pump pressure	900	3.2 - 3.8 (kg/cm²)				
1-3	Full load deliv. without charge-air pr.	900	32.5 - 33.5 (cc/1000st)				
	Full load deliv. with charge-air pres.		(cc/1000st)				
1-4	Idle speed regulation	350	4.7 - 7.7 (cc/1000st)				
1-5	Start	100	40.0 - 60.0 (cc/1000st)				
1-6	Full-load speed regulation	2700	10.9 - 16.9 (cc/1000st)				
1-7	Load-timer adjustment						
1-8							
2. Test values							
2-1 Timing device		N = rpm	900	1800	2300		
		mm	1.2 - 1.8	5.5 - 6.7	7.7 - 8.9		
2-2 Supply pump		N = rpm	900	1800	2500		
		kg/cm²	3.1 - 3.9	5.1 - 5.9	6.8 - 7.6		
2-3 Overflow delivery		N = rpm	900				
		cc/10s	35.0 - 79.0				
2-4 Fuel injection quantities							
Control lever position		Speed rpm	Fuel delivery (cc/1000 strokes)	Charge-air pres (mmHg)	Difference (cc)		
End stop		900	32.0 - 34.0		2.5		
		600	31.2 - 35.2				
		2300	30.6 - 34.6				
		2700	10.4 - 17.4				
		2800	below 6.0				
Switch off		350	0				
Idle stop		350	4.2 - 8.2				
		500	below 4.5				
Partial load		900	4.1 - 14.1				
2-5 Solenoid		Cut-in voltage max. 8 V Test voltage: 12 - 14 V					

3. Dimensions		
K	3.2 - 3.4	mm
KF	5.7 - 5.9	mm
MS	1.1 - 1.3	mm
BCS	-	mm
Pre-st.	-	mm
Control lever angle		
α	21 - 29	deg
A	7.6 - 11.7	mm
β	39 - 49	deg
B	11.9 - 15.6	mm
γ	10.5 - 11.5	deg
C	5.5 - 6.1	mm

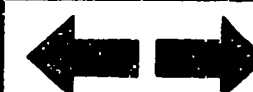
E10

ZEXEL - Test values  
Injections pumps



E11

ZEXEL - Test values  
Injections pumps



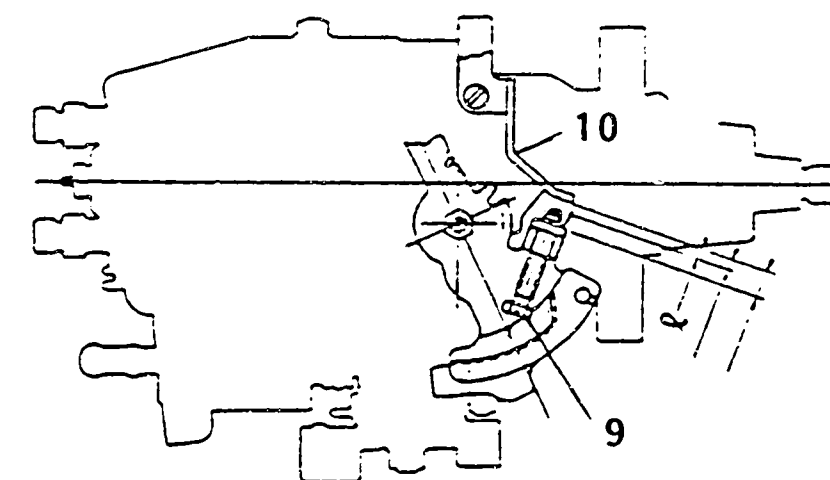
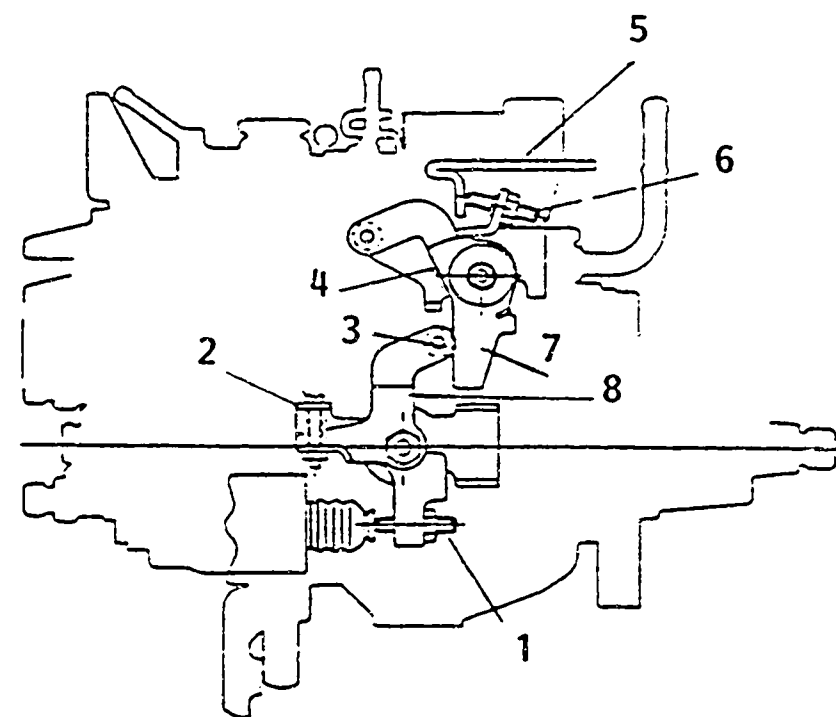


Fig. 27

- 1 = Timer stroke adjusting screw
- 2 = Idling adjusting bolt
- 3 = Lever roller
- 4 = Aligning mark

- 5 = Control lever
- 6 = Intermediate lever set screw
- 7 = Intermediate lever
- 8 = CSD lever

- 9 = Idling stopper bolt
- 10 = Bracket

104749-2501 2/4

# ■ W-CSD ADJUSTMENT

## 1. Timer stroke adjustment (adjust to the thick line)

1) Calculate the timer stroke from Fig. 28 according to the atmospheric temperature at the time of adjustment.

2) Adjust using the timer stroke adjusting screw so that the timer stroke is as calculated in Fig. 28 (diagramm).

E12

ZEXEL - Test values  
Injections pumps



E13

ZEXEL - Test values  
Injections pumps



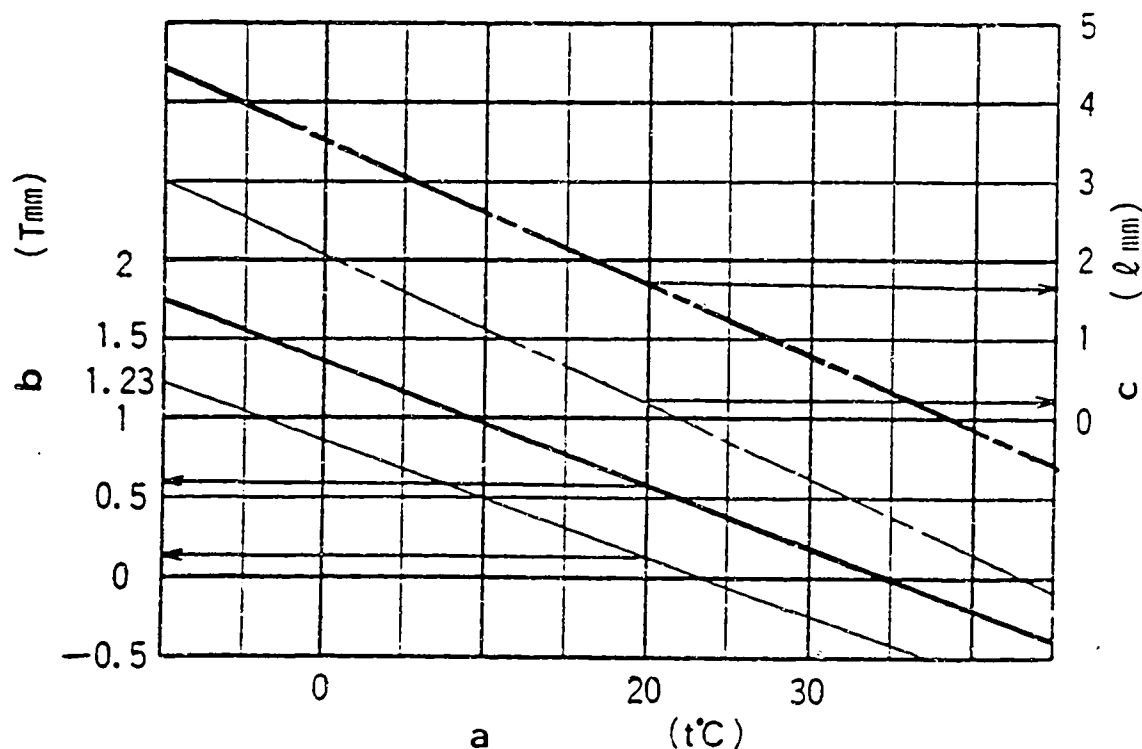


Fig. 28 (Continued)

a = Atmospheric temperature

b = Timer stroke ( $T \pm 0.1$  mm)

c = Gap between control lever and  
adjusting stopper bolt

Thick line: For temporary adjustment

Thin line: For final adjustment

Formula for calculating timer stroke: (Fig. 28)

$$T = -0.0367 t + 1.424$$

Formula for calculating control lever and idling  
stopper bolt gap:

$$l = -0.095 l + 3.6.$$



## 2. Intermediate lever position adjustment

- 1) Insert a block gauge (thickness gauge) of  $0.25 \pm 0.05$  mm thickness between the bracket and the idling stopper bolt.
- 2) Align the intermediate lever with the aligning mark.
- 3) Adjust the intermediate lever set screw so that the control lever and the intermediate lever set screw are in contact, and then fix in position using the locknut.

104749-2501 3/4

## 3. CSD lever adjustment

- 1) Calculate the block gauge dimension  $l \pm 0.05$  mm from (Fig. 28) according to the atmospheric temperature at the time of adjustment.
- 2) Insert the block gauge (thickness gauge) selected in (Fig. 28) between the bracket and the idling stopper bolt.
- 3) Using the idling bolt, adjust so that the CSD lever roller and intermediate lever are in contact.



#### 4. Final adjustment

After completing the adjustment, screw the timer stroke adjusting screw two turns clockwise.

(Move from the temporary adjustment chart to the final adjustment chart).

- \* This W-CSD's timer stroke operations are effective at atmospheric temperatures of 27°C or above. Therefore, to make adjustment at normal temperatures possible, after adjusting to the substitute characteristics, tighten the timer stroke adjusting screw two turns.

#### Note:

1. The temperature of the wax must be below 30°C when adjusting.
2. When inserting a block gauge (thickness gauge) between the control lever (bracket) and the idling stopper bolt, use the idling adjusting bolt to separate the CSD lever and intermediate lever so that no excessive force is exerted on them.





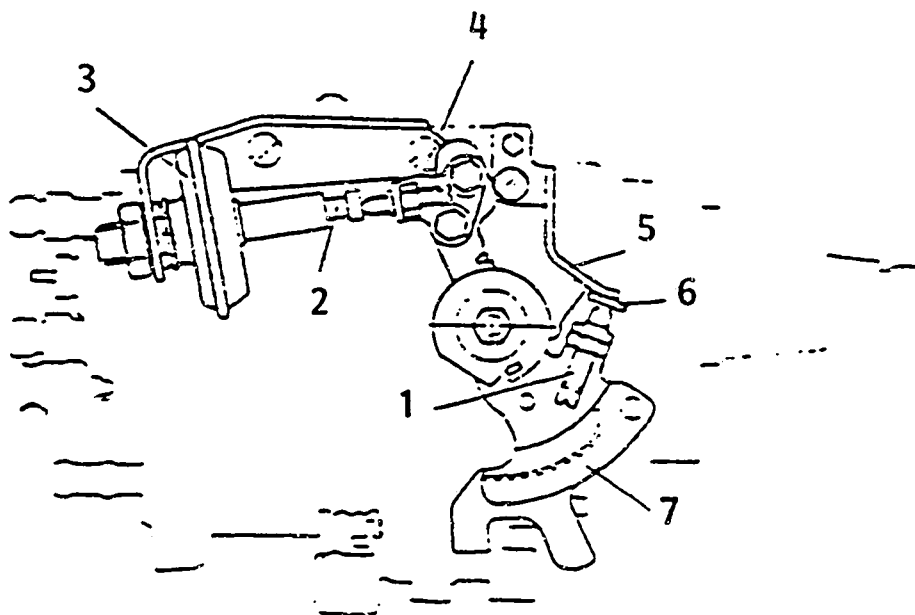


Fig. 29

104749 2501 4/4

- 1 = Idling stopper bolt
- 2 = Push rod
- 3 = Dashpot
- 4 = Dashpot adjusting screw
- 5 = Bracket
- 6 = Block gauge
- 7 = Control lever

#### ■ DASH POT ADJUSTMENT

1. Insert a block gauge (thickness gauge) of thickness  $3.8^{+0.05}$  mm in the gap between the control lever and the bracket.
2. With the control lever positioned as described in 1. above, adjust the dashpot adjusting screw so that the dashpot adjusting screw and the push rod are in contact.  
Fix the screw using the nut.



Test oil ISO 4113 or SAE J967d		ZEXEL - TEST VALUES Distributor pumps Engine model: C240				1/2 BOSCH No. 9 460 610 446 ZEXEL No. 104749-6811 Date: 25.10.1990 [1] Company: ISUZU No. 8-94470-554-1				
Injection pump no.:104649-6041		(NP-VE4/9F1250LNP616)								
Pump rot.: Counter-clockwise-viewed from drive side		Test-nozzle holder combination: 1 688 901 000				Test pressure line: 1 680 750 017				
1. Setting values		Speed (rpm)	Setting values			Charge-air pressure bar (mmHg)	Difference (cc)			
1-1	Timing device travel	1000	2.3 - 2.7 (mm)				2.5			
1-2	Supply pump pressure	1000	3.9 - 4.3 (kg/cm²)							
1-3	Full load deliv. without charge air pr. Full load deliv. with charge air press.	1000	36.4 - 37.4 (cc/1000st)							
1-4	Idle speed regulation	350	5.0 - 9.0 (cc/1000st)				2.0			
1-5	Start	100	45.0 - 51.0 (cc/1000st)							
1-6	Full-load speed regulation	1375	5.8 - 9.8 (cc/1000st)				2.5			
1-7	Load-timer adjustment									
1-8										
2. Test values										
2-1 Timing device	N = rpm mm		1000 2.2-2.8	1250 3.1-4.3	1375 3.7-4.5					
2-2 Supply pump	N = rpm kg/cm²	600 2.8-3.4	1000 3.9-4.3	1250 4.4-5.0						
2-3 Overflow delivery	N = rpm cc/10s		1000 48 - 92							
2-4 Fuel injection quantities										
Speed control lever pos.	Speed (rpm)	Fuel delivery (cc/1000st)	Charge-air pres (mmHg)	Difference (cc)						
End stop	1000	35.9 - 37.9								
	600	34.2 - 38.2								
	1250	36.8 - 40.8								
	1375	5.8 - 10.3								
	1425	below 4.0								
Switch off	350	C								
Idle-stop	350	5.0 - 9.0								
	400	below 4.0								
2-5 Solenoid	Cut-in voltage max. 8 V Test voltage: 12 - 14 V									
3. Dimensions										
K	3.2 - 3.4 mm									
KF	5.7 - 5.9 mm									
MS	1.1 - 1.3 mm									
BCS	- mm									
Control lever angle										
α	21 - 29 deg									
A	13.3 - 15.9 mm									
β	33 - 43 deg									
B	10.3 - 13.8 mm									
γ	- deg									
C	- mm									

E18

ZEXEL - Test values  
Injections pumps



E19

ZEXEL - Test values  
Injections pumps



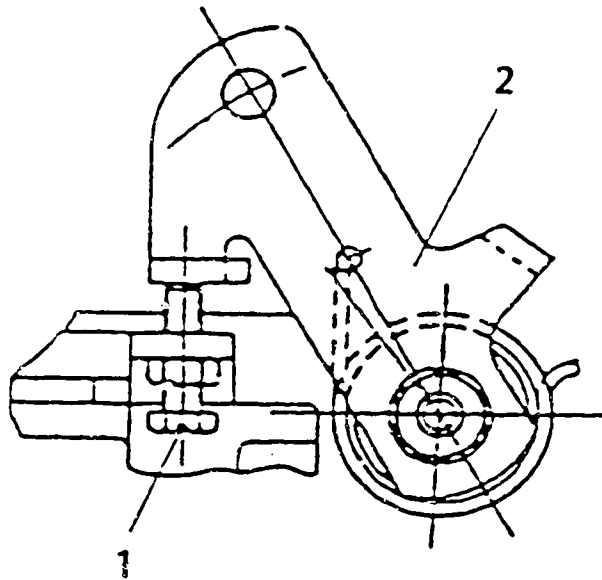


Fig. 30

104749-6811 2/2

- 1 = Stop lever
- 2 = Adjusting bolt

#### ■ STARTING INJECTION QUANTITY ADJUSTMENT

Adjust the starting injection quantity (item 1-5) using the adjusting bolt (Fig. 30).



Test oil ISO 4113 or SAE J967d		ZEXEL - TEST VALUES Distributor pumps Engine model: LD28				BOSCH No. 9 460 610 429 ZEXEL No. 104760-2150 Date: 25.10.1990 [2] Company: NISSAN No. 16700 V0791	
Injection pump no.:104660-2002		(NP-VE6/10F2500RNP1)					
Pump rot.: Clockwise-viewed from drive side		Test-nozzle holder combination: 1 688 901 000				Test pressure line: 1 680 750 017	
1. Setting values		Speed (rpm)	Setting values			Charge-air pressure bar (mmHg)	Difference (cc)
1-1	Timing device travel	1200	2.4 - 3.0 (mm)				2.5
1-2	Supply pump pressure	1800	5.7 - 6.3 (kg/cm²)				
1-3	Full load deliv. without charge air pr. Full load deliv. with charge air press.	1200	33.8 - 34.8 (cc/1000st)				
1-4	Idle speed regulation	350	6.7 - 9.7 (cc/1000st)				3.0
1-5	Start	100	above 47.0 (cc/1000st)				
1-6	Full-load speed regulation	2700	7.0 - 13.0 (cc/1000st)				
1-7	Load-timer adjustment						
1-8							
2. Test values							
2-1 Timing device	N = rpm mm		1200 2.3-3.1	1800 4.8-6.0	2300 7.7-8.6	3. Dimensions  K 3.2 - 3.4 mm KF 6.54 - 6.74 mm MS 1.7 - 1.9 mm BCS - mm Pre-st. - mm  Control lever angle α 21 - 29 deg A 2.5 - 8.0 mm β 39 - 49 deg B 11 - 16 mm γ 10.5 - 11.5 deg C 6.7 - 7.3 mm	
2-2 Supply pump	N = rpm kg/cm²	800 3.3-4.1	1800 5.6-6.4	2500 7.1-7.9			
2-3 Overflow delivery	N = rpm cc/10s	1000 53.0-97.0					
2-4 Fuel injection quantities							
Speed control lever pos.	Speed (rpm)	Fuel delivery (cc/1000st)	Charge-air pres (mmHg)	Difference (cc)			
End stop	1200	33.3 - 35.3					
	600	27.0 - 31.0					
	2300	28.4 - 32.4					
	2700	6.5 - 13.5					
	2800	below 5.0					
Switch off	350	0					
Idle-stop	350	6.2 - 10.2					
	500	below 4.0					
2-5 Solenoid	Cut-in voltage max. 8 V Test voltage: 12 - 14 V						



Test oil  
ISO 4113 or  
SAE J967d

ZEXEL - TEST VALUES  
Distributor pumps  
Engine model: RD28-T

BOSCH No. 9 460 610 423  
ZEXEL No. 104769-2152  
Date: 31.10.1990 [1]  
Company: NISSAN  
No. 16700 22J00

Injection pump no.: 104669-2152

(NP-VE6/9F2300RNP57)

Pump rot.: Clockwise-viewed from drive side

Test-nozzle holder combination:  
1 688 901 000

Test pressure line:  
1 680 750 017

1. Setting values	Speed (rpm)	Setting values	Charge-air pressure bar (mmHg)	Difference (cc)
1-1 Timing device travel	900	1.1 - 1.5 (mm)	342 - 362	
1-2 Supply pump pressure	900	3.5 - 4.1 (kg/cm <sup>2</sup> )	342 - 362	
1-3 Full load deliv. without charge air pr.	600	31.3 - 32.1 (cc/1000st)	0	2.0
Full load deliv. with charge air press.	900	38.6 - 39.4 (cc/1000st)	240 - 260	2.0
1-4 Idle speed regulation	350	6.6 - 8.6 (cc/1000st)	0	0.9
1-5 Start	100	above 38.0 (cc/1000st)	0	
1-6 Full-load speed regulation	2350	35.3 - 37.3 (cc/1000st)	470 - 490	4.5
1-7 Load-timer adjustment				

## 2. Test values

2-1 Timing device	N = rpm mm	900 1.1-1.5	1800 4.3-5.4	2300 6.3-7.4	2500 6.5-7.4	
2-2 Supply pump	N = rpm kg/cm²	900 3.5-4.1	1800 5.6-6.2	2300 6.9-7.5		
2-3 Overflow delivery	N = rpm cc/10s	900 43.0-87.0				
2-4 Fuel injection quantities						
Speed control lever pos.	Speed (rpm)	Fuel delivery (cc/1000st)	Charge-air pres (mmHg)	Difference (cc)		
End stop	900	32.1 - 39.9	240 - 260			
	600	30.8 - 32.6	0			
	1200	42.0 - 46.0	470 - 490			
	1800	41.2 - 45.2	470 - 490			
	2200	40.5 - 46.5	470 - 490			
	2300	37.8 - 44.8	470 - 490			
	2350	34.8 - 37.8	470 - 490			
	2500	14.0 - 24.0	470 - 490			
	2800	below 3.0	470 - 490			
Switch off	350	0	0			
	900	0	342 - 362			
Idle-stop	350	6.6 - 8.6	0			
	500	below 3.0	0			
Partial load	900	6.6 - 12.6	0			
2-5 Solenoid	Cut-in voltage max. 8 V Test voltage: 12 - 14 V					

3. Dimensions	
K	3.2 - 3.4 mm
KF	6.54 - 6.74 mm
MS	1.7 - 1.9 mm
BCS	3.8 - 4.0 mm
Pre-st.	- mm
Control lever angle	
α	19 - 27 deg
A	8.7 - 12.9 mm
β	37 - 47 deg
B	11.5 - 15.2 mm
γ	10.5 - 11.5 deg
C	5.7 - 6.3 mm

## 3. Dimensions

K 3.2 - 3.4 mm  
KF 6.54 - 6.74 mm  
MS 1.7 - 1.9 mm  
BCS 3.8 - 4.0 mm  
Pre-st. - mm

## Control lever angle

α 19 - 27 deg  
A 8.7 - 12.9 mm  
β 37 - 47 deg  
B 11.5 - 15.2 mm  
γ 10.5 - 11.5 deg  
C 5.7 - 6.3 mm

E23

ZEXEL - Test values  
Injections pumps



E24

ZEXEL - Test values  
Injections pumps



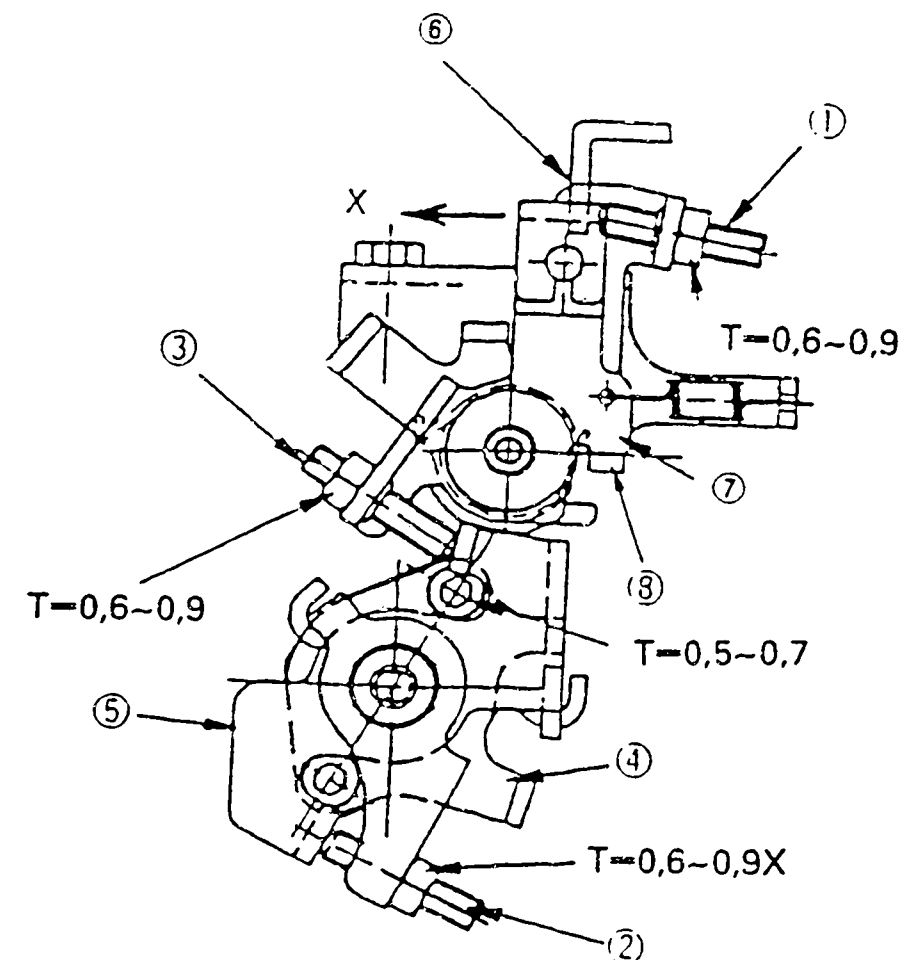
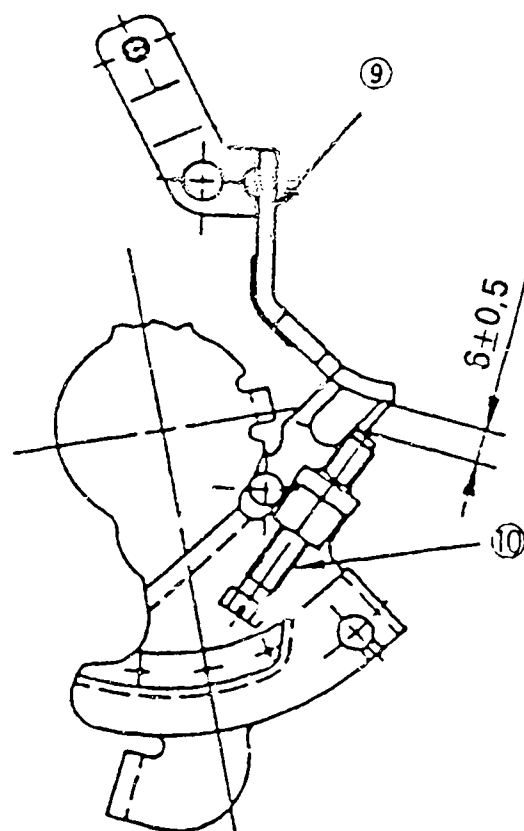


Fig. 31

104749-2152 2/3

9 = Idling set bracket

6 = Control lever  
7 = Intermediate lever

# M-CSD ADJUSTMENT

## 1. CSD Adjustment

- 1) Hold the control lever (6) in the idling position.
- 2) Move the CSD lever (5) to the right until it contacts the stopper (4).
- 3) Then, adjust the position of the screw (2) so that the timer stroke is  $1.6 \pm 0.2$  mm and fix the screw (2) using the nut.

E25

ZEXEL - Test values  
Injections pumps



E26

ZEXEL - Test values  
Injections pumps



(Continued)

## 2. Fixing the Intermediate Lever Adjustment Screw

- 1) Hold the CSD lever (5) in the position described in item 1 (timer stroke:  $1.6 \pm 0.2$  mm).
- 2) Move the intermediate lever (7) toward 'X' and confirm that it contacts the stopper (8).
- 3) Then, adjust the screw (3) so that the CSD lever (5) contacts the screw (3) and fix the screw (3) using the nut.
- 4) Return the intermediate lever (7) to its original position and confirm that the timer stroke is 0 mm.

## 3. Screw (1) Adjustment

- 1) Move the intermediate lever (7) toward 'X' until it contacts the stopper (8).
- 2) Adjust the position of the screw (1) so that the gap between the idling set bracket (9) and screw (10) is  $6 \pm 0.5$  mm, and fix the screw (1) using the nut.
- 3) Then, confirm that the gap between the control lever (6) and screw (1) is approximately 1.7 mm.



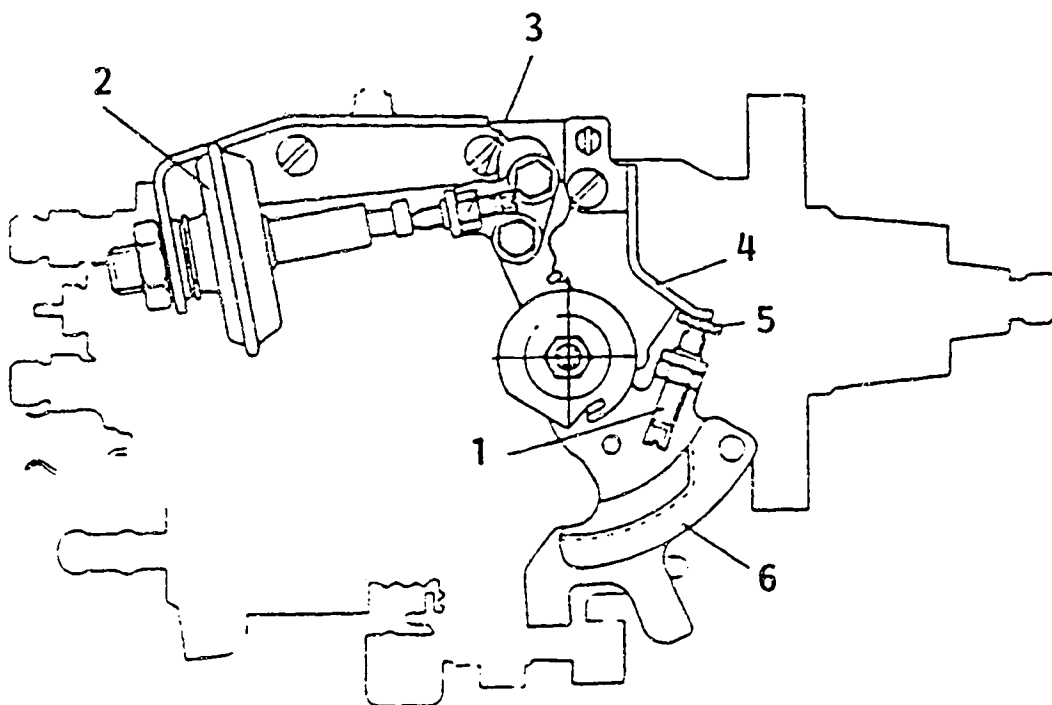


Fig. 32

104769-2152 3/3

- 1 = Idling stopper bolt
- 2 = Dash pot
- 3 = Dash pot adjusting screw

- 4 = Bracket
- 5 = Block gauge
- 6 = Control lever

#### ■ DASH POT ADJUSTMENT

1. Insert a block gauge (thickness gauge) of thickness  $3.8 \pm 0.05$  mm in the gap between the idling stopper bolt and the bracket.
2. With the control lever positioned as described in 1. above, adjust the dashpot adjusting screw so that the dashpot adjusting screw and the pushrod are in contact.  
Fix the screw using the nut.





# ZEXEL - TEST VALUES

## Injection pumps

BOSCH No.	:	9 400 610 124	1/5
ZEXEL No.	:	106692-4832	
Date	:	31.10.1990	[0]
Company	:	KOMATSU	
Engine	:	S6D125 /6151-71-1154	

IP-Type number	:	106069-5420 / PE6P
Governor type number	:	105407-3962 EP/RSV

### TEST PREREQUISITES

Test oil	:	ISO-4113
Test oil inlet temperature °C	:	40.00...45.00
Inlet pressure bar	:	1.6
Test nozzle holder combination	:	1 688 901 013
Opening pressure bar	:	175
Test pressure line		
Inner x Outer Dia - Length mm	:	3.00 x 8.00 x 600

### PORT CLOSING

Prestroke	mm	:	3.75 ± 0.05
Rod position	mm	:	-
Port closing mark Cyl. No.	:		-
Cam sequence	:		1-5-3-6-2-4
Port closing mark Cyl. No.	:		-
Port closing difference °NW	:		0-60-120-180-240-300
Tolerance	+ - °C	:	0.50 (0.75)



Injection Quantity :

Adjusting Point	Rod Pos. (mm)	Speed (rpm)	Injection Q'ty (cc/1000 str.)	Difference (%)	Fixed	Remarks
A	10.2	1100	150.7 - 154.7	± 3	Lever	Basic
B	approx. 6.5	350	10.5 - 13.5	± 15	Rack	

Timing Advance Specification :

Speed (rpm)							
Advance Angle (deg)							

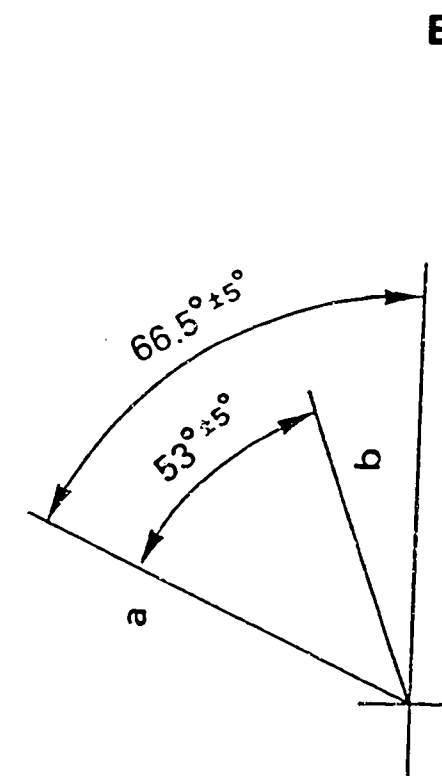
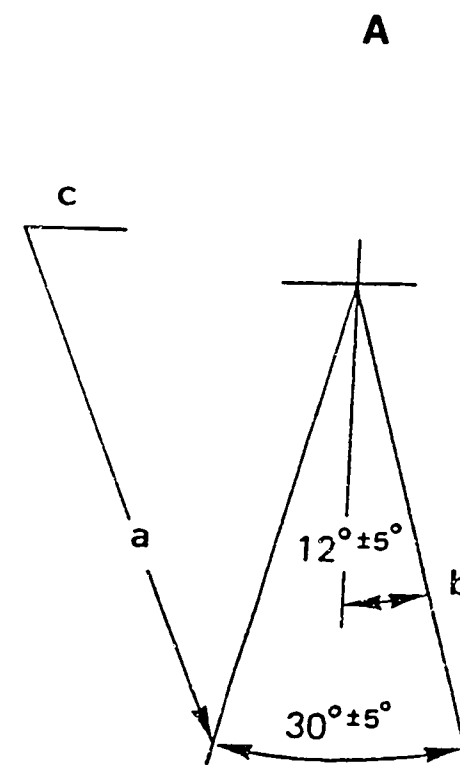
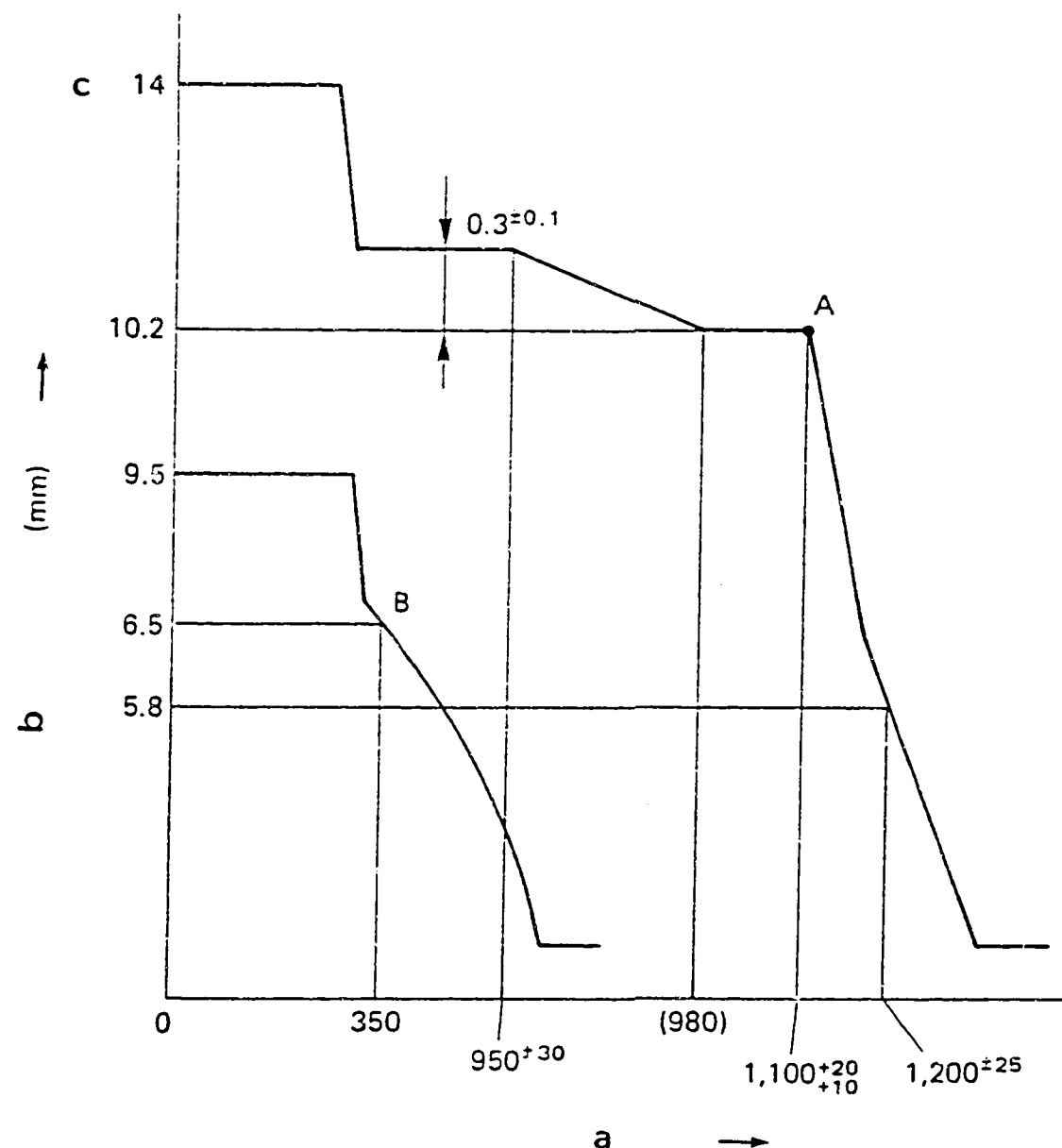


Fig. 33

# GOVERNOR ADJUSTMENT

101602-4832 2/5

a = Pump speed (rpm)  
b = Control rack position  
c = above

A = Stop lever angle  
a = Idling  
b = Full-speed  
c = Stopper bolt set

B = Stop lever angle  
a = Normal  
b = Stop

## Note

- Before adjustment, remove the idling sub spring.
- Move the control lever fully in the stop direction, and set the minimum-speed stopper bolt so that the control rack position is 0.5 - 1.0 mm.

F4

ZEXEL - Test values  
Injections pumps



F5

ZEXEL - Test values  
Injections pumps



	Pump speed (rpm)	Rack position (mm)	Remarks
Full-speed Adjustment (Temporary)	1110 - 1120 1100	10.2 10.2	<ul style="list-style-type: none"> <li>• Adjust using screw (1)</li> <li>• Confirm</li> </ul>
Torque Control spring Adjustment	700 approx. 350 (980) -	10.4 - 10.6 6.5 10.2 -	<ul style="list-style-type: none"> <li>• Adj. using spring cap.(3)</li> <li>• Confirm</li> <li>• Confirm</li> <li>• Confirm the torque control stroke is 0.3 mm</li> </ul>
Idling Adjustment	0 350 -	9.5 6.5 -	<ul style="list-style-type: none"> <li>• Fix the control lever</li> <li>• Adj. using spring cap.(4)</li> <li>• Confirm</li> </ul>
Maximum-speed Adjustment	1110 - 1120 1185 - 1215	10.2 5.8	<ul style="list-style-type: none"> <li>• Adjust using screw (2)</li> <li>• Confirm speed droop</li> <li>• Adjust using screw (5)</li> <li>• Confirm</li> </ul>
Full-load Adjustment (Install the cover on governor cover)	1100	10.2	<ul style="list-style-type: none"> <li>• Adjust using screw (2)</li> </ul>
Control Lever Angle Measurement	<ul style="list-style-type: none"> <li>• Measure the control lever angle at the "idling" and "full" positions.</li> <li>• When the control lever is depressed toward the "full" position, replace the shifter's shim with a thicker one.</li> <li>• When the control lever is depressed toward the "idling" position, replace the shifter's shim with a thinner one.</li> </ul>		

F6

ZEXEL - Test values  
Injections pumps



F7

ZEXEL - Test values  
Injections pumps



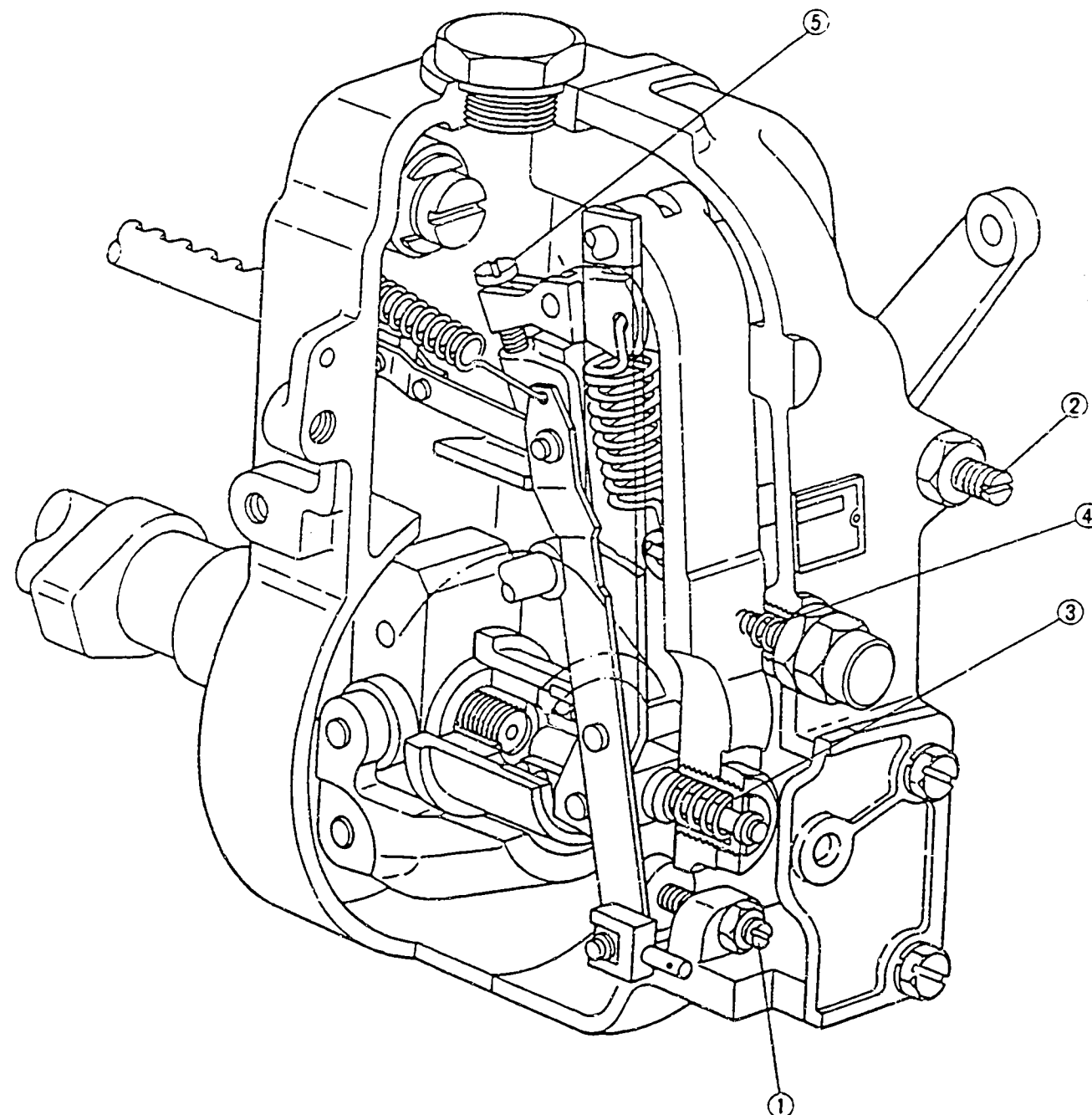


Fig. 34

- 1 = Screw
- 2 = Screw
- 3 = Spring capsule
- 4 = Spring capsule
- 5 = Screw

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**F8**

ZEXEL - Test values  
Injections pumps



**F9**

ZEXEL - Test values  
injections pumps



# **CONTROL LEVER REACTION FORCE ADJUSTMENT**

1. Loosen bolt (2) a little.  
Using bolt (4), move the cancel spring's hooking point to find the position specified in the specifications.  
Fix bolt (4) using nut (3), and fix the lever (5) using bolt (2).
2. After adjusting the control lever's reaction force, operate the pump at 350 rpm, gradually move the control lever from the FULL position and confirm that it returns to the idling position.  
Control lever reaction force: 0.6 kg-m.  
This is the force required at high idling ( $1200 \pm 15$  rpm) to move the speed lever from the position where it contacts the stopper bolt when positioned at the FULL side.
3. Confirm that the control lever returns to the idling position when it is moved from the stop position.

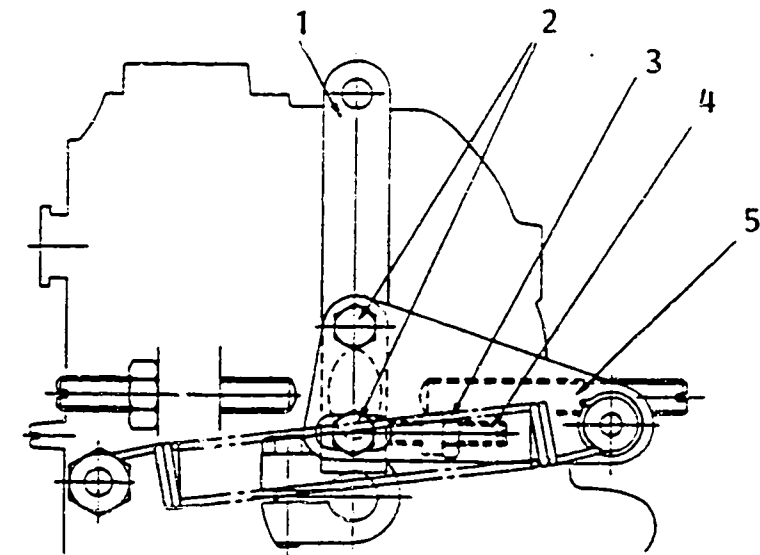


Fig. 35

- 1 = Lever
- 2 = Screw
- 3 = Bolt
- 4 = Screw
- 5 = Lever

